THE PAPER INDUSTRY and PAPER WORLD

VOLUME 22
NUMBER 2
MAY, 1940

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PUBLISHER
FRITZ PUBLICATIONS, Inc.

Founded by
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Published monthly, on the tenth of the month, by Fritz Publications, Inc., 59 E. Van Buren St., Chicago, Ill. Eastern Representative: L. D. Schnabel, 9 Rockefeller Plaza, New York, N. Y. Pacific Coast Representative: Norman C. Nourse, 1031 S. Broadway, Los Angeles, Calif. THE PAPER INDUSTRY and PAPER WORLD is a member of the Audit Bureau of Circulations and The Associated Business Papers, Inc. Entered as second class matter June 29, 1938, at the post office at Chicago, Ill., under the Act of March 3, 1879. Subscriptions in the United States, U. S. Possessions, Canada, Cuba and Mexico, $2.00 for one year, or $3.00 for two years. All other countries, $3.00 for one year, or $5.00 for two years. Copyrighted 1940 by Fritz Publications, Inc.

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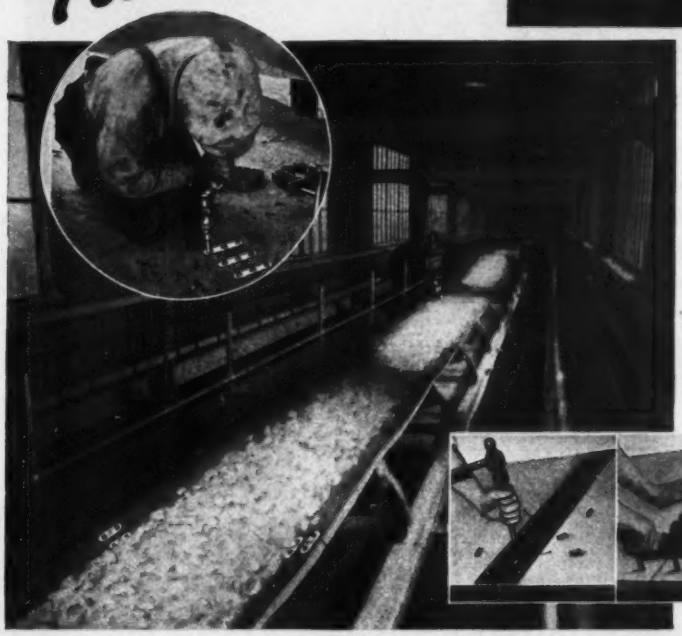
Belt Fasteners FOR PULP AND PAPER MILLS



– for fastening, repairing and patching conveyor belts

● You can avoid shutdowns and lengthen the life of your conveyor belts by using Flexco HD Belt Fasteners and Rip Plates. These Flexco fasteners make a strong, tight butt joint with long life. Recessed plates embed in the belt, compress belt ends and prevent ply separation. Made in five sizes in steel and alloys to cover corrosion resisting, abrasive resistant, and non-magnetic requirements.

Belt Fastener

Rip Plate

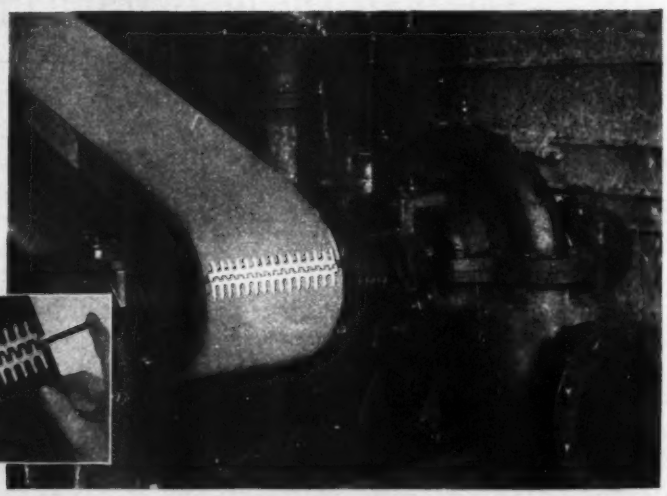
Flexco HD Rip Plates are used in repairing rips and patching conveyor belts. Their use saves expensive replacements and extended shutdowns.

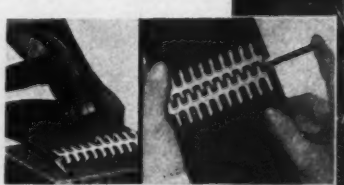
Bulletin F-100 shows exactly how to handle conveyor belt fastening and repair work with these Flexco HD Belt Fasteners and Rip Plates. Write for your copy.

– for lacing transmission belts

● For the lacing of transmission belts Alligator Steel Belt Lacing is the most universally used belt lacing in the world. It is applied easily and quickly with a hammer—no holes are punched and the teeth do not cut across the belt fibres. It embeds in the belt and is smooth on both faces. The two piece rocker hinge pin greatly increases the service life and the joint is remarkably flexible. The pin can be easily removed to separate the belt.

Every plant should have a supply of Alligator Steel Belt Lacing on hand. Twelve sizes for flat belts of all types up to ⅜" thick. Special lengths for wide belts. Also made in "Monel" and "Everdur."





FLEXIBLE STEEL LACING CO., 4606 Lexington St., Chicago, Ill.

FLEXCO HD BELT FASTENERS and ALLIGATOR STEEL BELT LACING

SOLD BY SUPPLY HOUSES EVERYWHERE

TRADE WINDS

NEW GROUP TO MANAGE WAUSAU PAPER MILLS

Operation of the Wausau Paper Mills, Brokaw, Wisconsin, is now under the guidance of a newly-organized group, members of which are well known in the pulp and paper and allied fields.

Ben Alexander, formerly president of the company, is now chairman of the board and Harold C. Collins, formerly treasurer and assistant secretary, is now president. Other members of the group include C. C. Yawkey, who remains as vice president; Carl Magnus, vice president in charge of production; Harold E. Knott, vice president in charge of sales; A. F. Woodson, secretary; D. Clark Everest, treasurer, and Glenn Stevens, assistant secretary and assistant treasurer.

All officers of the company are widely-known throughout the industry. Mr. Alexander is president of the Masonite Corporation and is associated with many other outstanding paper and lumber companies throughout the United States and Canada; Mr. Yawkey is chairman of the board of Marathon Paper Mills, Rothschild, Wisconsin; Mr. Everest is president of the same firm and is also a past president of the American Paper and Pulp Association; Mr. Magnus, who has been associated with the Waterfalls Paper Mills for the past four years, has also been active in both the American Pulp and Paper Mill Superintendents Association and the Technical Association of the Pulp and Paper Industry, and Mr. Knott has been associated with the Eastern Corporation for the past twenty-two years. Mr. Knott has been active in the Salesmen's Association of the Paper Industry. He served as treasurer of the paper foundation, which sponsored and operated the paper industry exhibit at Chicago's Century of Progress Exposition. The new officers bring with them their own organization for key operating positions at the mill and plan to bring out a complete new line of quality mill brand papers, embracing the top grade watermarked sulphite bonds and ledgers as well as unwatermarked and a complete line of papers for the Mimeograph duplicator and the liquid and gelatin process. They will also make a diversified line of sulphite specialties, offset and cover papers.

INDUSTRY COMMITTEE'S VOTE NOT UNANIMOUS

The Industry Committee appointed by the Wage and Hour Division of the Department of Labor to consider the minimum wage of the pulp and primary paper industry disagreed at the hearing held in Washington, D. C., on March 22. The vote of the committee stood 10 to 8 in favor of a 40-cent minimum.

All of the employer representatives and two of the public representatives voted with the minority while the employee representatives and four of the six public representatives voted with the majority. Both majority and minority reports have been submitted to the administrator and a public hearing will be held shortly.

Since the announcement of the committee's personnel (cf. THE PAPER INDUSTRY AND PAPER WORLD, p. 1236, March, 1940) it is learned that S. H. Slichter, public representative, has been replaced by Arthur D. Hill, Sr., of Boston, and that A. R. Heron of San Francisco has replaced J. D. Zellerbach.

In the report and recommendation returned by the committee there is included a concrete definition of the pulp and paper industry which should prove of interest to those associated with that industry. The definition is reproduced herewith:

"For the purpose of this order the term 'pulp and primary paper industry' means the manufacture of pulp, for any purpose, from fibrous material capable of yielding cellulose fiber and the manufacture of paper and of board from such pulp and from such fibrous material or either of them with or without addition of any non-cellulose fiber, colorant or filler.

"The term 'manufacture' as used in this order means all operations involved in the production of pulp, paper, and board, starting with the unloading of raw materials at the mill site and ending with the delivery of the finished paper or board to carriers for sale as such or to converting departments within the same mill or company. It includes finishing operations normally performed in the paper or board mill, such as packing, trimming, cutting to size, sorting, plating, sizing, supercalendering, and other processing, but does not include any treating, processing or refabrication of finished paper or board to produce converted paper or board products."

◆

ENGLAND MAY GET NEWSPRINT FROM CANADA

Leslie Burgin, British Minister of Supply, has approved a preliminary plan to import huge quantities of newsprint from Canada to stave off a threatened paper famine in the United Kingdom.

The Newspaper Proprietors' Association, acting on behalf of the entire press, has obtained official support for its plan, details of which are now under consideration.

Until individual publishers submit figures on the tonnage they are likely to require as their share of the Canadian supply, the size of the order cannot be computed. One estimate said that approximately 400,000 tons of Canadian newsprint is expected to be shipped during the 1940 open season.

It is understood that before approving the scheme the Minister insisted that:

1) The size of newspapers must further be reduced in order to help preserve present stocks.

2) When Canadian supplies arrive they must not be touched till a big reserve has been built up. This reserve is said to be in the region of 200,000 tons.

Monday, April 29, all national

dailies with exception of the *Times* and *Daily Telegraph*, were reduced to eight pages. Simultaneously content bills were abolished.

All leading evening papers in the north of England will be raised in price from a penny to three half-pence.

In Ontario the legislature is investigating the newsprint situation in its province and has agreed that a commission or board should be set up to control the newsprint industry in the province, particularly with regard to the output of the mills.

Peter Heenan, Minister of Lands and Forests, also advocated an organization with jurisdiction over all Canada, that would solicit business for Canadian pulpwood companies, dividing the orders on a proportionate basis.

Ontario and Quebec are the only two provinces that have a pro-rating system at present and the legislature hopes to have the rest of the Dominion adopt this system so that a basis applicable for all Canada could be achieved in the industry.

This system prohibits price-cutting in the newsprint industry, fixes the price of newsprint at $50 per ton and allots tonnage to the various mills on a basis of capacity production.

As an indication that he intends pursuing wide inquiry into Ontario's timber resources, Colonel George A. Drew has asked the Ontario legislature timber and newsprint probe to call several important witnesses identified in the paper industry.

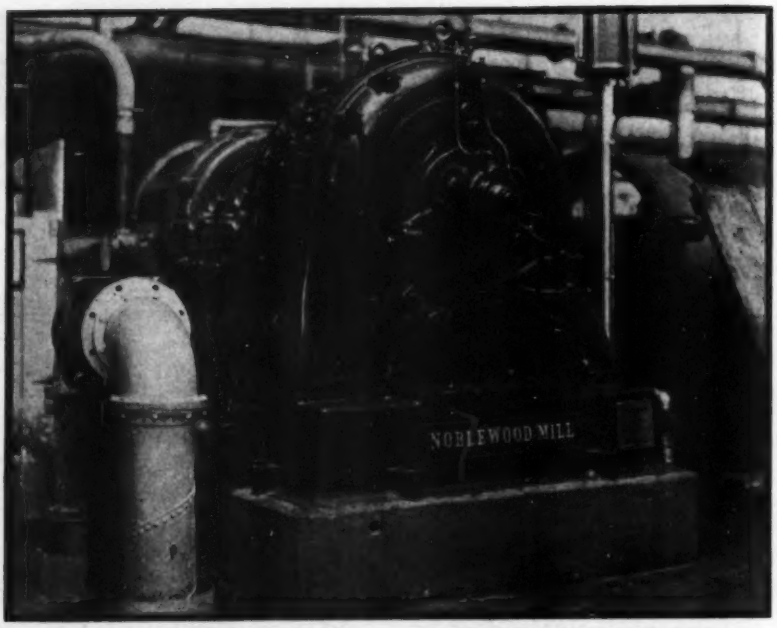
E. E. Johnson, chairman of the Fort William Industrial Commission, in testimony before the legislature, stated that the highest grades of timber are going into the lowest grades of paper, adding that the basic implement in diversification of timber resources is the old-fashioned sawmill. He presented facts to show that Ontario could produce 300,000,000 feet of saw logs with a market in the United States and England.

◆

MASONITE MILL AT GATINEAU ON FULL SCHEDULE

The Masonite Company of Canada has brought its new mill at Gatineau, Quebec, into commercial production, it was reported recently.

The mill, which has a capacity of approximately 35 million square feet a year, started operations on February 15. Since that time the machinery has been tuned up and stock has been built up in anticipation of regular distribution this month. The company is controlled by the Canadian International Paper Company and the Masonite Corporation.



Noblewood Mill tried out on No. 3 paper machine in Nepco's Nekoosa mill.

NEPCO IMPROVES PAPER MACHINES

New improvements have been made on the Number 5 and 6 machines of the Nekoosa-Edwards Paper Company's Port Edwards (Wisconsin) mill. The improvements, made in order to further reduce the dirt content of the fine papers made on these machines, consist of a complete installation of Purifiners on the Number 5 machine and battery of Vortraps on the Number 6 machine.

Because of the location of these devices to treat the paper stock immediately before it is converted into a sheet of paper, a large proportion of all dirt is removed, whether present in the original pulp or picked up during preparation or storage.

Studies and improvements in the field of pulp refining during the past five years have consistently taken the direction away from the conventional Holland beater toward the development of special refining machines that are designed to provide closer control over refining operations and to give faster development of the pulp with proper regard to the power expended to obtain the results desired.

The Nekoosa-Edwards Paper Company has just completed a ten-month trial period of a Noblewood Mill on its Number 3 paper machine in the Nekoosa mill. The operation of this machine has pointed out several advantages. It has been found that the peculiar mechanical action of this device produces a much cleaner sheet of paper by the separation of the shives and fiber bundles with the result that they do not show up in the finished paper. An abridged paper concerning the Noblewood Mill appeared on page 64 of the April (1939) issue of THE PAPER INDUSTRY AND PAPER WORLD. An illustrated description of the machine appeared on page 78 in the "New Equipment and Supplies" section of the same issue.

◆

GAIR CO. ACQUIRES NEW PHILA. PLANT

Complete equipment for the manufacture of corrugated shipping cases and other corrugated products will be installed by the Robert Gair Company, Inc., in its newly-acquired property in Philadelphia. The property, formerly the Canada Dry Building, contains about 70,000 square feet of manufacturing space and is located at the corner of Rhawn and Tacony streets.

The new property has a railroad siding on the Pennsylvania Railroad main line and in addition to the building itself has several acres of land available for expansion. The most modern equipment and manufacturing methods will be used and special emphasis will be placed on fine color printing. The new plant was acquired in the interests of service to the company's customers in the Middle Atlantic states and especially in the vicinity of Philadelphia.

In addition it is reported from Portland, Maine, that the Robert Gair organization has purchased land in that city and will soon construct a plant for the production of containers.

"Yu-u-r-r out!"

. . . SCREAMED THE UMPIRE ON PAGE 14 TO THE PENGUIN ON PAGE 15

"You mean . . . I'm *in!*" yawned the penguin, fluffing the infield dust from his wings and settling on home plate. "I'm *show-through* from the next page. I'm always getting into other people's business."

"Get offa the field or I'll fine ya!" roared the ump. "You—foul ball!"

"Now, now, ump," soothed the penguin. "Mustn't lose your temper. I know a cheaper way to strike me out of the picture."

"You mean Krebs Pigments?"

"Sure," said the penguin. "Krebs makes the thinnest paper opaque. Tell the paper-maker about these pigments, then watch me disappear like a home run over the fence."

"Sounds like a clean hit to me," said the ump, scratching his head.

"Cleanest you ever made," agreed the penguin. "You ought to see how white and bright Krebs Pigments make the paper . . . printing so sharp and clear on both sides that even the blindest umpire can read it."

"Opacity and whiteness, huh? That's a double play."

". . . *triple play*, ump. The Krebs people will help you with your technical problems, too. Just pitch 'em a letter —it only takes a minute."

"Play ball!" yelled the ump picking up his mask.

". . . with Krebs Pigments," winked the penguin.

KREBS PIGMENT & COLOR CORP.

1007 Orange Street . . . Wilmington, Delaware

FINANCIAL

The European war situation by which Scandinavia has become involved in the conflict had an immediate result on the security market for paper mill securities, with the result that the paper shares in the latter part of April became the focal point of chief issue in Wall Street trading. The companies whose securities rose most rapidly in price were those whose operations are least dependent on a need for foreign pulp.

American Writing Paper Corporation—Net profit for the first quarter of 1940 was $9,880, as against a net profit of $26,320 for the same period in 1939.

Badger Paper Mills—Net profit for 1939 was $251,905, as against $255,146 in 1938.

Brown Company—A loss of $3,294,003 for fifty-three weeks ending December 2 compares with a loss of $3,825,458 for the same period of the preceding year.

Certain-teed Products Corporation—Net profits for 1939 were $348,099, as against $171,010 in 1938.

Chillicothe Paper Company—Net profit in 1939 was $150,625, as against $19,612 in 1938.

Consolidated Water Power and Paper Company—Net profit for 1939 was $1,531,982, as compared with $477,901 for the preceding year.

Container Corporation of America—Negotiations have been completed for a loan of $5,000,000 from seven banks, for the redemption of its outstanding 6 per cent bonds and 5 per cent debentures. The loan is at an interest rate from 1½ per cent to 2 per cent, depending on the maturities. No dividends are to be declared when such payment would reduce surplus to less than $2,500,000 or working capital to less than $3,500,000. Earnings for the first two months of 1940 were $346,102, as against a loss of over $35,000 in the same period of 1939.

Continental-Diamond Fibre Company—Net profit for 1939 was $222,610 as against a loss in 1938 of $651,792.

Flintkote Company—Net earnings for 1940, first quarter, were $114,318, as against $102,494 for the same period in 1939.

Gaylord Container Corporation—Net profits for the first quarter were $201,122 as compared with $123,891 for the first quarter of 1939.

International Paper and Power Company—Net earnings for 1939 were $4,893,590, as compared with $124,075 in 1938. Southern Kraft, whose figures are included, had a profit of $2,539,001 as against $1,037,211 in 1938. The parent company reduced its funded debt $6,233,401, most of which was in long term debt.

Kimberly-Clark Corporation—Earnings for the quarter ending March 31 were $745,045, as against $598,660 for the same quarter of 1939.

Lily-Tulip Cup Corporation—Net profits for 1939 were $682,217, as against $225,062 for the preceding year.

MacAndrews and Forbes—Net earnings for the first quarter of 1940 were $209,486 as against $186,065 for the same period in 1939.

Masonite Corporation—Net profits for the quarter ending March 16 were $254,873, as against $223,411 for the same quarter the preceding year.

Mead Corporation—Net income for twelve-week period ending March 23 was $357,511 as against $77,110 for the same period in 1939.

Nekoosa-Edwards Paper Company—Net income for 1939 was $182,409, as against $20,956 in 1938.

Northern Paper Mills—Net profit for 1939 was $240,133, as compared with a net loss of $102,490 in 1938.

Rhinelander Paper Company—Net profit for 1939 was $272,456, as against $118,140 in 1938.

Soundview Pulp Company—Net for the first quarter of 1940 was $537,036 as compared with $54,383 for the same quarter of 1939.

Southern Advance Bag and Paper Company—An issue of $3,200,000 in 4½ per cent bonds has been authorized to retire two 6 per cent bond issues and smaller separate indebtedness.

Sutherland Paper Company—Net profit for the year ending March 31 was $808,678, as compared with $505,894 for the preceding fiscal year. Stockholders are offered 43,050 common shares at $22 per share, in the ratio of three-twentieths of the stock held, the additional funds to be used to increase inventories of pulp in view of the war in Scandinavia. A merger proposal by Continental Can Company has been rejected because of an unsatisfactory ratio of stock offered, but the negotiations may be resumed.

Union Bag and Paper Company—Profits for the first two months of 1940 were more than half the company's entire profits of $965,000 in 1939.

United Paperboard Company—Net earnings for nine months ending Feb. 24 were $1,542, as against a loss for the same period a year ago of $15,292.

United Wall Paper Factories—The entire outstanding issue of 6 per cent bonds due 1947 has been called for payment at 103½.

New York Stock Exchange—Stocks	Closing Prices April 25 1940	March 25 1940
A. P. W. Paper Co...	*3¼–3⅞	*2½–2¾
Celotex	10¾	10⅜
Same Preferred	*67–70	66
Certain-teed	6⅞	6¾
Same Preferred	32¼	30¼
Champion P. & F. Co.	28¼	21
Same Preferred	*105⅛–105¼	105¼
Container Corp	19	15
Cont. Diamond	8⅞	7⅛
Crown Zellerbach	19	15⅜
Same Preferred	93⅜	90
Dixie Vortex	13½	*13–13⅜
Same "A"	37⅜	*36¼–37
Flintkote	18⅞	19¼
Robert Gair	4⅞	3
Same Preferred	19	12½
Gaylord Container	14½	11⅜
International P. & P.	19⅜	11⅜
Same Preferred	70⅜	53¾
Kimberly-Clark	44	37¼
MacAndrews & Forbes	33½	34
Masonite	32⅞	35¼
Mead Corp	13⅜	9¼
Same 6% Preferred	79½	*76–79
Paraffine Co.	42⅛	42½
Same Preferred	*100–101½	*95–101¼
Rayonier	25⅜	16⅜
Same Preferred	33¾	*27–27¾
Scott Paper	43	46⅜
Same Preferred	*112–112¾	109
Sutherland Paper	28⅜	30½
Union Bag & Paper	18	12¼
United Paperboard	*6–6¼	4⅜
U. S. Gypsum	82	82
Same Preferred	*173–179	*176–180
New York Stock Exchange—Bonds		
Celotex 4½%	88½	87⅝
Certain-teed 5½%	80¾	79½
Champ.P.&F.Co. 4¾%	105	104⅛
Container Corp 5%	101¼	101⅜
Inter. P. & P. 5%	103⅜	102
Same 6%	102½	98
New York Curb Exchange—Stocks		
Am. Boxboard	7½	5½
Brown Co. Pfd	32	25
Det. Paper Prod	1	*¾–⅞
Great Northern	*48–48⅝	42½
Hummel Ross	7⅜	5
Nat. Container	13¼	9½
St. Regis	4⅛	2⅜
Taggart	*3–5¼	4⅜
United Wall Paper	2¼	2⅛

*Closing Bid and Asked Prices.

◆

▸▸▸ ALMOST EVERY WEEK a report circulates in New England that the long-awaited Brown Company reorganization plan is ready to be acted upon by the court and security holders. But, as late as May 1, this development has not occurred. Conditions are very favorable to the plan at present as the company's mills in Canada and New Hampshire are operating at capacity and the increased export tonnage recently received from Japan insures this situation for some time. Approval of the plan will release $10,000,000 of RFC funds, a portion of which is earmarked for mill improvement and new machinery.

THE STRONG MAN OF LEADS...

GETS STRONGER UNDER STRESS

You have to be pretty husky to land the job of professional Strong Man. And then the work you do makes you even more husky.

Tellurium Lead is like that. A rugged lead to begin with, it toughens under stress. In other words, Tellurium Lead *work-hardens*. When rolled, hammered or stretched, it actually becomes tougher. Therefore:

1. Turnover points and joints are less subject to cracking.
2. Where vibration is excessive, buckling and creeping are cut down to a minimum.
3. Where heat changes are frequent and rapid, there is less danger of fracture.

Another point to remember! Tellurium Lead dulls the bite of sulphuric and other corrosive acids. This improved acid resistance holds good even at temperatures not far from the metal's melting point.

Tellurium Lead of our manufacture is time-tested St. Joe chemical lead, alloyed with a small quantity of tellurium. It gives the desirable advantages of this well-known chemical lead plus important new ones. Yet the cost is only a fraction of a cent more per pound than chemical lead. In sheets, pipe and coils. For further facts, write to our nearest branch.

NATIONAL LEAD COMPANY—New York, Baltimore, Buffalo, Chicago, Cleveland, Cincinnati, St. Louis; National-Boston Lead Co., Boston; John T. Lewis & Bros. Co., Philadelphia; National Lead & Oil Co., Pittsburgh; Georgia Lead Works, Atlanta; American Lead Corporation, Indianapolis; Master Metals, Inc., Cleveland; The Canada Metal Company, Ltd., Toronto, Montreal, Winnipeg and Vancouver.

TELLURIUM LEAD

Paper . . .

ON PARADE

King Papyrus (Jack Harley of South Carolina) and his queen (Harriette Clark of Georgia) at the coronation ceremony during the Coastal Empire Paper Festival, Savannah, Georgia.

▸▸▸ THE RAPIDLY DEVELOPING new paper industry in the South was emphasized and extolled in fun and frolic and by serious discussion about the conference table at the recent second annual Coastal Empire Paper Festival held at Savannah, Georgia. For a solid week, beginning April first and continuing through April seventh the Coastal Empire of the South Atlantic seacoast was made paper conscious, while its citizens reveled in the joyousness and frivolity of the spring festival.

Parades and street dancing in the bunting-draped streets of the downtown section; sail and motor boat regattas on the broad reaches of the Wilmington River at Thunderbolt; naval warship demonstrations in the Savannah River along Yamacraw Bluffs, where Oglethorpe first landed to establish the colony of Georgia; golf tournaments, dog shows; the crowning and feting of Coastal Empire royalty; the gathering of leaders in the manufacture of pulp and paper in convention—all revolving around the center theme of *Paper*—attracted more than 50,000 visitors to Savannah during the week.

The more serious portion of the paper festival program centered in the meetings of the Southern States Pulp and Paper Club, of which R. H. Laftman, general manager of the National Container Corporation, Jacksonville, Florida, is general chairman, and the executive committee of the Southern Pulpwood Conservation Association, of which James H. Allen, president of the Florida Pulp & Paper Company, is president.

The highlight of the meeting of the Southern Pulp and Paper Club was the address by Walter L. Savell, of the Mathieson Alkali Works, Inc., of New York. He emphasized the fact that now is the time that the pulp and paper makers turn their attention to stopping the waste that is at the present time being dissipated through the smokestacks of their factories. Mr. Savell declared that there is a tremendous loss to the industry in the valuable gases now being thrown away through the factory smokestacks. "The industry has come along far enough that some first class attention should be given to this important matter," Mr. Savell stated in the course of an address on "Synthetic Saltcake." As a remedy for this situation Mr. Savell suggested that the use of a scrubber in addition to the disc evaporator would eliminate some of this lossage, as many of the particles passing off in fumes are large enough to settle out if they are wetted.

William F. Allen, vice chairman of the club, who is technical director of the Herty Foundation Laboratory at Savannah, presided at the sessions.

Eskell Nordell, of the Permutit Corporation, New York, made an interesting talk on the softening of water used in bleaching. The open discussions centered about the subject, "Pulping of Pine and Hardwoods, or Hard and Easy Bleaching Sulphate Pulps."

Slight changes in the forestry program were made at the one-day session of the executive committee of the Southern Pulp Wood Conservation Association. The program has for its main purpose the leaving of all land on which pulpwood is cut in good condition.

The entertainment features of the festival centered around a Royal Court composed of princes and princesses, representing counties throughout the Coastal Empire. From among these King Papyrus and his queen were selected to rule during the week. South Carolina provided the king in the person of Jack Harley, of Barnwell. His queen was princess Harriette Clark, of the Dutchy of Bryan in Georgia. They were crowned King and Queen Papyrus of the Coastal Empire at the grand coronation assemblage and ball held on Tuesday evening.

Interesting exhibits, showing the growing of pulp trees and their conversion into pulpwood; the care and protection of pulpwood lands, and other interesting features directly related to the pulp and paper industry, were shown all week at municipal auditorium.

Four street parades featured the festival. The Mummers parade on Monday evening displayed all of the comedy and gayety that could be crowded into a mile long display. Another honored the Royal Court, in which their majesties, surrounded by their entourage, smiled and bowed to their subjects as they moved grandly through Savannah's stately old streets where the gorgeous flame of azaleas blended with the striking colors of royalty. Preceded and followed by waves of military and naval units, this was one of the impressive parades of the festival. The children came into their own on Friday when the children's parade was held, and all activities for this day centered about entertainment for the younger folk. The gorgeous parade of formal floats on Saturday marked the peak of the closing day of the festival. More than forty beautiful floats, representing as many different themes, paraded through throng-lined streets.

A mecca for all was the amusement center set up at Daffin Park, where Johnny J. Jones Shows held forth for the entire week. At this park also were the dog show, where proud and pedigreed canines from the Coastal Empire competed for blue ribbons, and daily baseball games between Savannah Indians and visiting "big time" teams returning from spring training.

Following the close of the festival it was unanimously voted by the incorporators of the festival association to begin plans immediately for the 1941 Festival, and that it will be on an even more elaborate scale than the one just closing.

. . . . and now you can form good light and heavy sheets on the same machine.

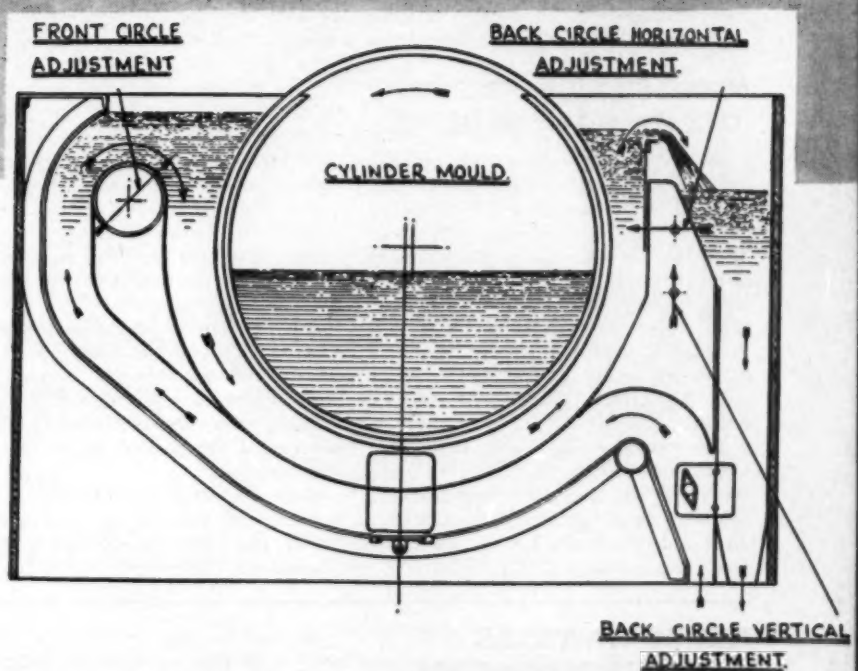


Illustration shows the simple construction of the Stream Flow Vat. There are two vat circles. The outer circle is fixed and prevents any leakage out of the vat. The inner circle is flexible and quickly adjustable during operation at front and back. The entire bottom of the inner circle is permitted to take the smooth curve of flexure. The bottom circle is adjusted by raising or lowering the back circle.

WITH the Puseyjones Stream Flow Vat, operators can make the ideal setting for any sheet in a few seconds while running.

This new cylinder vat permits the formation of very free stock of widely different weights and sheet characteristics . . . over a wide range of speeds on the same machine . . . and gives the best possible formation for each condition.

Adjustments are simple. The Stream Flow Vat is operated with dials and pointers on the tending side of the Machine.

The Stream Flow Vat solves the problem of leakage common to older vats because the stock on both sides of the adjustable circle is of the same nature and consistency with practically no pressure difference between them. The very small amount of leakage past the well-rounded edges of the inner circle helps to keep the "dead edges" of the vat from becoming stagnant.

The flow around the outer circle provides a very important approach pass of full width before the flow reaches the making board.

Further particulars on request.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-Making Machinery. Wilmington, Del.

Carton press room in new addition to plant of Menasha Products Co., Menasha, Wis.

MENASHA PRODS. CO. OCCUPIES NEW BLDG.

Extensive improvements, including a new general office building, and an addition to the plant, have been made by the Menasha Products Company, Menasha, Wisconsin, division of Marathon Paper Mills Company. This latest addition is a part of the company's current building expansion program and follows a rebuilding and modernization of the company's pulp mill, paper and paperboard plant at Rothschild, Wisconsin.

The new building makes available more than 70,000 additional square feet of factory space. The new manufacturing building consists of a basement and two floors, 220 feet by 110 feet. The basement floor is to be used for storage of raw materials while the first floor will be utilized for carton production. The second floor will be used for the manufacture of several Menasha specialty products and will also house the company's technical and research laboratories. Improvements include re-routing of production operations and installation of new printing and finishing equipment.

The new air-conditioned offices are now occupied by the company's administrative and clerical personnel. Sales, engineering, production and accounting offices and the company's art department are located in the four-story structure.

Both buildings are of reinforced concrete slab construction with brick facing and both are completely air-conditioned.

NEPCO INSTALLS NEW INSTRUMENT FOR RECORDING

An automatic recording instrument, capable of constant accurate measuring of acid and alkaline conditions throughout a bleach has been installed in the Port Edwards bleach plant of the Nekoosa-Edwards Paper Company, Port Edwards, Wisconsin. This is said to be the first time such an instrument has been permanently installed on a high density bleacher, although portable instruments employing the principle have been on the market for several years. Installation of the instrument was a co-operative project between the manufacturer of the instrument—the Leeds & Northrup Company of Philadelphia—and the Nekoosa-Edwards Paper Company.

Within the past ten years an entirely new electrode for the electric measurement of acidity and alkalinity has been developed and perfected. The important part of this type of electrode is an extremely thin-walled glass bulb. The glass walls on this bulb are so thin that electrical contact can be made through the glass. With an electrode such as this, acid and alkaline conditions may be investigated in the presence of bleach liquor because the bleach liquor is entirely isolated from the electrode by the thin glass walls.

In operation, water is squeezed from the pulp in the bottom of the high-density bleacher into a collection chamber. A small pump pumps this water, which incidentally carries with it the acid or alkali present at any moment during the bleaching period, up to the floor level and through a small chamber where the measuring electrodes are located. This is a continuous process during the whole bleaching procedure.

The automatic feature of the instrument employed provides for frequent periodic checks on the accuracy of the instrument itself, and the recording feature draws a continuous line record of the acid or alkaline conditions prevailing during the entire bleach. Since the usual tendency is toward the development of acidity, alkaline materials such as caustic soda or lime may be added continuously or intermittently in sufficient amounts to control the conditions within the narrow desired range.

Preliminary information obtainable to date indicates that a saving of chlorine will be possible through the use of controlled bleaches. Also a considerably greater portion of the native strength of the pulps entering the bleach plant will be retained in the finished product than was heretofore possible. There is also some evidence that a small increase in native opacity of the pulp may be expected, as well as minor improvements in the bulking qualities of the pulp so prepared.

◆

NEW ENGLAND PULP NEWS

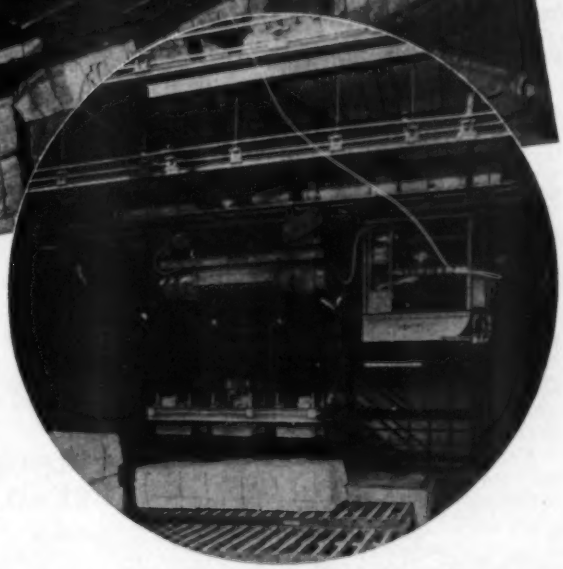
Raw materials are beginning to reflect the excited market which has resulted from the extension of the war to Norway. Spot Scandinavian kraft has sold at $70 dock in one case and $72 in another. To properly appreciate what this means it should be noted that a sale of the $72 brand was consummated, just prior to the German invasion, at $54 dock equivalent.

Furthermore, it has been announced that $60, f.o.b. mill, will be the market starting May 1, of an important domestic brand of sulphate, and that a southern bleached kraft has commanded $80 on spot. It was known previously that one of the best Swedish bleached krafts had commanded this figure but prior to the week of April 22-27 the top confirmed figure was $73 for a domestic white sulphate.

The stoppage of sulphite from Scandinavia has caused a veritable price chaos. In New England, while contracts for second quarter are being fulfilled at $61.50 to $65 and $52.50 to $55 for bleached and unbleached respectively, it is clear that spot pulp would bring at least $75 and $65 respectively. The emphasis is on unbleached because there exists so little domestic capacity to take the place of the absent Swedish shipments.

In a generous mood, West coast mills have not at this writing changed

One Cleveland Tramrail system with screw-type grab serves this 8000-ton pulp storage room.



Three bales are picked up at a time with this patented Cleveland Tramrail screw grab. Motor-driven screws secure and release bales without operator leaving cab.

CLEVELAND TRAMRAIL SYSTEM with

NEW SCREW GRAB

makes big savings in

Baled Pulp Handling

Cleveland Tramrail has again pioneered another step in solving the materials handling problems of the paper industry, by the development of a screw-type baled pulp grab.

This new grab has auger-form motor-driven screws which worm into bales of pulp, holding them securely for transportation. Bales are released by reversing the screws.

With a Cleveland Tramrail system, complete plant coverage may be obtained. Bales may be picked up at unloading platform, placed in storage, reclaimed from storage and delivered to breaker beaters.

In most mills one operator can take care of the complete pulp-handling job faster and more economically than ever before possible. All operations are made by means of easily-manipulated controllers in the cab attached to the grab carrier. It is not necessary for the operator to leave the cab.

Why not let us give you the details of this new *money-making* development?

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1165 Depot Street Wickliffe, Ohio

CLEVELAND TRAMRAIL

their position regarding advanced freight rates effective May 1 on intercoastal shipments by vessel. They are absorbing the 50c per ton rise. Furthermore, several New England converters state that producers in the far west have also absorbed the extra charge applied on shipments by all-rail, which will be an increasingly important percentage of the total movement because of the dwindling intercoastal fleet. In New England, an even more conspicuous result of the pulp shortage has been the sharp waste paper advance. Everyone has heard of the rise in the basic grades of waste, but the kraft wastes have been affected profoundly. Kraft corrugated box cuttings which sold to a New England board mill at $28 in the first of April have been contracted by a midwestern manufacturer at $40 f.o.b. Boston for May shipment. Sales of kraft envelope cuttings at $50 also establish a $10 price gain for the month, directly attributable to the pulp market.

◆

H. & W. CO. PLANS LARGER PRODUCTION

An interesting point in the Hollingsworth and Whitney Company's annual statement was the fact that of a net profit of $616,801, the company made $215,846 in interest and sale of U. S. government bonds. The company's sales and profits showed a substantial gain over 1938.

Despite the new mill in Alabama, the company adds that it is planning to continue producing as much, if not more, paper in the Maine mills than the company has made there in the past. The report adds that additions made to the Waterville mills increased production to the extent that they are more than taking care of the former production of the obsolete Gardiner mills which have been closed.

◆

CONTAINER CORP. WILL HAVE NEW PLANT IN TEXAS

A new plant for the fabrication of folding cartons and corrugated shipping containers will be established at Fort Worth, Texas, by the Container Corporation of America. J. R. Neil, formerly eastern sales manager, will head both sales and operations of the new division.

The plant will occupy approximately 100,000 square feet of leased space and will manufacture both wet and dry cartons. About 125 people will be employed when the entire unit is operating. The cost of the investment will come to about $250,000.

NEW BRUNSWICK MAY HAVE NEW RAYON PLANT

The erection of a new rayon staple fiber plant may take place in New Brunswick, if plans now being discussed materialize.

A conference for discussion of the manufacture of rayon staple fiber from wood pulp was held recently at Fredericton, N. B., under the sponsorship of the New Brunswick Economic and Industrial Advisory Board. Participating in the conference was F. J. Norton, an authority on the subject. Mr. Norton contended that the closing out of supply sources for the rayon staple fiber in Germany and the British Isles would be beneficial to Canada. It is on this premise that the establishment of a plant is under consideration.

All of the fiber produced in such a plant would be exported to the United States, it was said. The outline of the project has been submitted to the New Brunswick government. Tentative plans call for operations by a private company organized by New Brunswick capital and with bonds guaranteed by the provincial government, which policy prevails with the Port Royal Pulp and Paper Company, Fairville, N. B. This plant is one of those rumored as considered for an extension in which the fiber would be manufactured from wood pulp.

◆

NO FLOOD THIS YEAR IN HOLYOKE

Papermakers in Holyoke, Massachusetts, are rejoicing over the fact that there was no flood this year. Although ten feet of water passed over the Holyoke dam spanning the Connecticut River, none of the mills felt any effects and in spite of heavy rains and untimely snow falls in April, the river failed to go on its annual rampage which, in the past, has cost mill owners thousands of dollars. The greatest disaster came in 1936 when eighteen feet of water inundated mills causing them to shut down for some time. A sea wall is now in progress and future floods will be averted through its construction.

◆

NEW WRINKLE, INC. TO HOLD TWO-DAY LAB. CONFERENCE

A two-day laboratory meeting . . a Technical Production Conference . . sponsored by New Wrinkle, Inc., will be held at Dayton, Ohio, May 17-18. The meeting will be held for the purpose of acquainting its licensees' production superintendents with New Wrinkle's latest development. It is expected that about 150 technical men will be present.

The first day's program is to include demonstrations of the formulation, manufacture and application of Wrinkle finishes of both the alkyd and varnish types (cf. THE PAPER INDUSTRY AND PAPER WORLD, p. 550, Aug. 1939). A short inspection trip will be made through one of Dayton's largest factories where Wrinkle is used. The technical men will thus have an opportunity of viewing the application of "Wrinkle" under production line methods.

On the second day, sessions at the company's laboratory will continue and will consist of an exposition of the experimental developments upon which New Wrinkle, Inc., has been engaged. Time will be arranged for the discussion of any practical problems in connection with the formulation, manufacture and application of "Wrinkles."

◆

GROVETON PAPER IN CONSOLIDATION

Consolidation of three companies to facilitate corporate setup has been accomplished in the case of the Groveton Paper Company, Groveton, New Hampshire, the Odell Manufacturing Company and the Coos Realty Corporation. Capitalization of the consolidated firm is $150,000. The consolidation had court approval and followed an equity proceeding brought by H. W. Brooks, of Portland, against the Odell Manufacturing Company. Officers of the new company are: Dr. Owen Smith, Portland, president; Frank E. Moses of Groveton, treasurer, and George T. Baine, clerk. Directors include the foregoing in addition to H. E. Munroe and W. N. Munroe, and Philip Colby.

◆

INT'L NEWS PRICES FIRM TO OCT. 1

The International Paper Company's current domestic newsprint prices, which are now fixed through June, will be extended throughout the third quarter of this year at the present level, according to an announcement by R. J. Cullen, president of the company. These prices now named firm until October 1, 1940, will have remained unchanged since January 1, 1938, a period of thirty-three months during which no advance has occurred. The International Paper Company hopes this degree of stability, particularly in times like these, will benefit its customers throughout the country.

SPADEWORK...

THERE'S simply no getting away from it. If Adolphus Q. Bickle wants to win that tulip award he's after, the only way he will do it is by more and better spadework.

Here at Shell our lubrication men never try to get away from the preliminary digging that cuts the cost of friction in industry. Every day they go out in search of it.

You will find Shell lubrication men in a Detroit machine shop conducting a test run with an improved cutting lubricant . . . in a Carolina paper plant studying the possibility of improving dryer-roll lubrication. Or checking the effect of lubricating oil in relation to exhaust-port carbon formation and operating temperature in a marine Diesel. Or you will find them investigating the reaction of a new type of extreme pressure lubricant on screw-downs on a blooming mill.

It's this first-hand digging that enables Shell refineries to produce lubricants keyed to the needs of your machines *today.*

Perhaps Shell can help with your lubrication problem. Why not call in your Shell man today?

SHELL

SHELL INDUSTRIAL LUBRICANTS

SOUTHLAND BOARD CONSIDERS EXPANSION

The board of directors of Southland Paper Mills, Inc., Lufkin, Texas, met on April 15 and re-elected all officers except that of secretary. C. B. Edwards was named for this office to succeed S. W. Henderson, Jr. At the stockholders meeting which was held the day before the directors meeting, the following new directors were added to the board: Lou Calder, New York City; R. W. Wortham, Jr., Paris, Texas; and M. E. Kurth, of Houston, Texas. The other directors were re-elected with the exception of Alex Weisberg, of Dallas, Texas.

It is stated that the mill at Lufkin which now operates one paper machine is operating at capacity and could double production by the addition of another machine. At the meeting of the board, President Kurth appointed a committee to consider the feasibility of early expansion and methods of financing same. They will report at the next board meeting to be held late this month.

◆

BRITAIN RELEASES NORWEGIAN SHIPS

It is reported that three Norwegian vessels which had been held up in British ports since the invasion of Norway and which had been chartered to bring pulpwood from Nova Scotia and New Brunswick to the Maine Seaboard Paper Company at Bucksport and the Eastern Corporation at Brewer, Maine, have been released. Efforts to release the vessels were made by Representative Brewster of Maine who took the case to the British embassy. Some 62,000 cords of wood are to be moved by these vessels in a number of scheduled trips.

◆

PLAN SULPHITE PULP MILL ON VANCOUVER IS.

Of wide interest in pulp and paper circles on the Pacific coast is the announcement made that Bloedel, Stewart & Welch, large logging and sawmill organization operating in British Columbia, Canada, plans construction of a sulphite pulp mill at Port Alberni, B. C.

It is proposed to have a mill of 135 ton initial capacity to be located close to the company's export mill on the West coast of Vancouver Island. Estimated cost is $2,750,000 and construction is to begin as soon as negotiations with Port Alberni officials regarding water concessions are completed.

The vast timber holdings of the Bloedel organization have long caused them to be regarded as a prospective factor in the pulp industry on the West coast. In its Douglas fir operations a large amount of hemlock suitable for pulping is taken out and this will now go to the pulp mill instead of being converted into lumber.

J. H. Bloedel, of Seattle, is president of the company; S. G. Smith is general manager.

◆

RUINS DISCLOSE HISTORIC MILL SITE

Construction of the new mill of the Kimberly-Clark Corporation at Neenah, Wisconsin, is progressing rapidly with the schedule calling for completion by July 18. Excavation and footings are practically completed. The building, part of the $1,000,000 expansion program at Neenah, is to be 76 by 240 feet and two stories high. It will be used for the manufacture of coarse wadding and insulation, and is located on the canal between the old Neenah and Badger Globe mills.

Timbers uncovered by steam shovels excavating for the basement of the new plant at Neenah are believed to be remnants of century-old locks that were privately built by Harvey Jones, a Neenah pioneer. The story is that Jones built the locks at his own expense after the Government refused to appropriate any moneys, contrary to what the Government had done in adjoining Menasha. The timbers, uncovered just west of the main offices, are well preserved.

◆

BARDEN BILL IS DEFEATED IN HOUSE

The Barden Bill (H. R. 7133) incorporating a number of amendments to the Wage and Hour Law was defeated on April 30 by a vote of 156 to 66 in the House of Representatives.

Two amendments included in the Barden Bill were particularly pertinent to pulp and paper operations. These amendments were:

1) To exempt "the felling of trees, logging, or operations incidental to the felling of trees or logging performed prior to delivery and the delivery of the logs to a mill for sawing, making pulp, or other processing" from the maximum hour provisions in Section 7A of the Act and to limit the exemptions to 56 hours a workweek unless overtime compensation is paid (except for a period of 14 workweeks during which the exemption is complete).

2) To exempt from the wage and hour provisions, persons with a guaranteed monthly salary of $150 or more and who are not required to work any minimum number of hours.

The Barden Bill would have exempted 928,000 workers in industries handling agricultural products from the minimum wage provision of the law, which is thirty cents an hour at present. It also would have exempted an additional 988,000 workers in the same industries from the maximum 42-hour week authorized in the present act.

Other amendments to the Wage and Hour Law have come before the House, but as this issue goes to press, news reports state they have been defeated.

◆

BOOKLET—"PAPER IN WISCONSIN"

In order to set forth not only the contributions made but also something of the perseverance and resourcefulness that accompanied the building of papermaking in the State of Wisconsin, the Marathon Paper Mills Company, Rothschild, Wisconsin, has published a very interesting booklet entitled "Paper in Wisconsin."

The booklet was compiled by Francis F. Bowman, Jr., and in addition to much information data regarding the status of the paper industry in Wisconsin, contains extensive and well-written material on the history and development of one of Wisconsin's leading industries bringing in early history of the first mills in Kaukauna, Milwaukee, Beloit, Appleton, Whitewater and Neenah. The booklet also contains much information relative to the economic and social contributions of the paper industry in Wisconsin and a whole chapter is devoted to raw materials. Pulp and paper research is also given a prominent place in the booklet. Drawings, graphs and photographs are used to good advantage in bringing out the important points in this extremely worthwhile publication.

◆

DEXTER COMPANY IS REORGANIZED

Due to the recent demise of Francis J. Dooley, sulphite mill manager of the Dexter Sulphite Pulp and Paper Company, Dexter, New York, the receivers of the company thought it necessary to reorganize the management.

As a result of these reorganization proceedings, George H. Schell, formerly superintendent of the Bayless Pulp and Paper Company, Austin, Pa., and more recently superintendent of the Frontenac mill of the Dexter or-

ganization, was appointed general superintendent.

In addition, it was announced that A. W. Ayles, chief chemist, was appointed assistant to the general superintendent and the sulphite superintendent and that C. W. Hayes, formerly Mr. Dooley's assistant, was retained as sulphite superintendent.

◆

DROP CONTAINER ASS'N PROSECUTION

Prosecution of the National Container Association and the Stevenson Corporation was dropped on April 23 in the United States District Court at New York City by the entering of a consent decree. The decree affects the defendants as a corporation and sixty-five manufacturing companies controlling 65 per cent of the corrugated shipping container production of the United States. Among the practices which are enjoined in the future are the limitation of production, pro-rating of business or the fixing or controlling of prices. The decree, however, permits the collection of production cost statistics, production statistics, material costs data and credit information.

◆

PANGARA PLANS MILL TO USE CROSSLEY PROC.

Plans for the erection of a mill to produce pulp from the annual prunings of fruit trees are under consideration by Pangara Holding Corporation, Ltd., Toronto, Canada. The corporation controls the Crossley process for pulping fruit tree prunings and forest slash.

At the corporation's annual meeting on April 17, Donald Guthrie, R. J. Hart, W. S. Edwards, Harold Boyle, Gordon Mitchell, T. Linsey Crossley, and K. S. Sweetman were elected directors. The directors elected Mr. Guthrie president, Mr. Crossley technical director and Mr. Sweetman, secretary-treasurer.

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▶▶▶ A LARGE EXTENSION to the Mersey Paper Company's warehouse is now under way.

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▶▶▶ THE GEORGE BANTA PUBLISHING COMPANY, Menasha, Wisconsin, has purchased land owned in Menasha by the Mead Paper Company, Chillicothe, Ohio. The plant which formerly stood on this land and which was used for making straw and corrugated board was razed last year after it had been left vacant by the Island Paper Company. The publishing concern purchased the property for future expansion, but at present is using the area for parking space.

RECOMMENDING ATKINS AGAIN?

Yes Sir, More Than Ever. They're Saving Us Money On Every Cutting Operation

• Faster, cleaner, finer cutting — and more of it between grindings—this is the familiar result with Atkins Knives as well as other Atkins Cutting Tools. It shows up on cost records as time and money saved in production, and on sales records as more saleable products. And it explains why each year more plants end their search for lower cutting costs by standardizing on Atkins for every cutting operation.

Prove these results to your complete satisfaction, and at little cost, in your own plant, by Trial of a set of Atkins Chipper Knives, Paper Knife, or other Atkins Tools, with accurate check kept of performance.

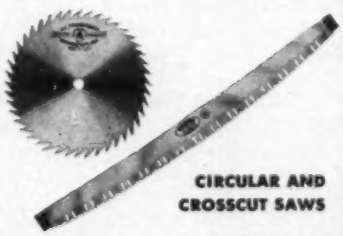
Send us your specifications and ask for prices.

E. C. ATKINS AND COMPANY

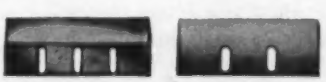
453 So. Illinois St., Indianapolis, Ind.

FROM TREES TO PAPER THERE'S HELP AT EVERY STEP FROM ATKINS

Co-ordination all along the line



CIRCULAR AND CROSSCUT SAWS



CHIPPER KNIVES

PAPER SLITTERS, KNIVES AND SHEARS

▶▶▶ THE INTERSTATE COMMERCE COMMISSION has ruled against northern paper mills in a complicated issue involving rates on north and south bound material. The rates in southern territory have been accepted by the commission despite the dissenting opinion of one commissioner who holds that the northbound rate for southern paper is 33 per cent higher than the rate for northern paper shipped south.

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▶▶▶ A NEW EXTENSION is now being made to the pulp plant of the Powell River Company, Powell River, B. C., in order to permit the addition of a dryer which is to produce unbleached sulphite pulp 90 per cent air dry. The project is scheduled for completion by July.

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▶▶▶ REPLACING THE PREVIOUS PLANT destroyed by fire last fall, the Sidney Roofing and Paper Company's new premises have now commenced operations. The new plant at Victoria, B. C., was formally set in operation in the presence of about fifty prominent figures in British Columbia business, industrial and governmental circles.

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▶▶▶ THE PAPER MACHINE in the Platner & Porter-Parsons Division of the American Writing Paper Corporation is now in operation. The machine, brought to Holyoke several years ago from the Unionville (Connecticut) division, has been down for some time but will now manufacture the company's Coupon Bond.

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▶▶▶ CANADIAN INTERNATIONAL PAPER COMPANY'S newsprint mill at Three Rivers, Quebec, is now operating on a full-time schedule for the first time in three years. As a result fifty additional men have been added to the working force. The mill is one of the largest in Canada with a producing capacity of 750 tons per day.

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▶▶▶ GROUND WAS BROKEN recently at the Thorold division of Provincial Paper Ltd., for a new steam plant. The plant will house a Kidwell boiler to be supplied by Canadian Vickers, Ltd.

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▶▶▶ A NEW ADDITION to the plant of the School Stationers Corporation at Menasha, Wisconsin, is now under construction. The addition will cost about $5,000 and will be of brick construction, 75 by 100 feet.

▶▶▶ NEW EQUIPMENT is being installed at the Toronto plant of the Hinde and Dauche Paper Company. It is said that the new equipment will increase the plant's capacity about 20 per cent. The Hinde and Dauche Company is making improvements in all divisions in an effort to effect further production economies and increase production.

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▶▶▶ IT IS POSSIBLE that under certain conditions the Quebec Pulp and Paper Corporation may start operations at the mill which has been closed down for a number of years. Considerable interest has been shown in the reference to this possibility in the company's annual report.

BRIEFS

▶▶▶ THE ONTARIO PAPER COMPANY is again pioneering in the field of groundwood pulp manufacture by making a practical trial of the Roberts type of continuous grinder.

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▶▶▶ ERECTION OF AN EXTENSION to the sheet pulp plant of the Powell River Company, Powell River, B. C., is now in progress. This new addition will permit the addition of a Flakt dryer and cutter to carry the pulp sheet from the Kamyr press installed in 1938, and deliver it 90 per cent air dry.

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▶▶▶ THE HUMMEL-ROSS FIBRE CORPORATION has licensed the Eddy Paper Corporation and the Kieckhefer Container Company to use the secondary head box under certain patents, it was announced recently. These latter two companies are in addition to the International Paper Company and the Southern Kraft Corporation announcement of which was made previously (cf. THE PAPER INDUSTRY AND PAPER WORLD, p. 1924, March, 1940).

◆

▶▶▶ WORK HAS BEGUN on the construction of a new plant for the Morgan Paper Company, manufacturers of paper boxes and containers in Toronto. Additions are also being made to the Acme Paper Box Company and the Queen City Paper and Twine Company.

ADVERTISING PAGES REMOVED

▶▶▶ THE BROWN COMPANY'S Solka trade with Japan has been resumed with the loading of 2,000 tons of the refined pulp aboard the Japanese motorship "Komaki Maru" at Portland Terminal Pier No. 1. This shipment, the first this year from the Maine port, will be followed by another cargo shortly after. The Japanese have assigned some of the newest and fastest freighters of the O. S. K. line for carrying this pulp.

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▶▶▶ CAPITAL REORGANIZATION is to be undergone by the Anglo-Canadian Pulp and Paper Mills, Ltd., Quebec City. The plans call for the establishment of a single class security. Authorization is being sought for the issuance of 1,500,000 no par value shares of which 1,050,000 will be allotted for existing securities.

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▶▶▶ AN INVENTIONS BOARD has been established by the Canadian Government to deal with the growing volume of inventions and suggestions intended to further Canada's war effort. K. S. Maclachlan, president of Fraser Companies, Ltd., and acting Deputy Minister (Naval and Air), is a member of the board.

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▶▶▶ CONSTRUCTION OF A fourth-story addition to the Riverside Paper Corporation, Appleton, Wisconsin, is now being planned by the company. The addition, which will cost about $25,000, will be 78 by 86 feet and will be used for storage purposes.

◆

▶▶▶ HAMMERMILL PAPER COMPANY, Erie, Pa., has replaced its geared type switcher steam locomotive, used for handling pulpwood, with a 65-ton, 350 hp., diesel-electric switcher. The new locomotive will be powered by two Cummins supercharged diesel engines. The locomotive was built by the General Electric Company.

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▶▶▶ CANADA HAS LOST its wallpaper market in Australia, as a result of new import restrictions imposed by the Australian government. Last year Canada marketed $65,955 worth of wallpaper in Australia.

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▶▶▶ THE DENNISON MANUFACTURING COMPANY of Canada is planning the erection of a new addition to its plant at Drummondville, Quebec. The new addition will cost about $45,000, it is reported.

Editorial ★ ★ ★

WORLD LOOKS TO U. S. FOR PULP AND PAPER

▶▶▶ THE NEWS THAT Germany had invaded Norway on Tuesday, April 9, hit the paper industry with the suddenness and frightfulness of the explosion of a thousand-pound bomb dropped on an unsuspecting civilian city. For the paper industry of the world is the hardest-hit, large tonnage industry in the world, as approximately one-half of the world's capacity tonnage of pulp and paper originates in the Baltic Basin. Of all the nations surrounding the Baltic Sea, Norway, Sweden and Finland have a capacity of almost nine million tons of newsprint, board, other papers, sulphite and sulphate pulps and mechanical pulp. The further disruption of the production and distribution of that huge tonnage to the world's dependent markets was a catastrophic happening which stunned the industry everywhere.

It is now a matter of weeks since Germany entered Norway, and England and France undertook to help the Norwegians repel their invaders. It seems obvious to a follower of subsequent events that the war now started on Scandinavian soil will be a long, bitter, and destructive struggle. As long as this condition lasts, no paper or pulp will be shipped from those countries to world markets. The result is that the world has but one source from which to get the paper and pulp of which it has been deprived by the war in the Baltic area.

This world-demand is already in evidence in this country in constantly increasing volume. Every day, sales of pulp and paper are being consummated at prices higher than domestic converters or consumers have been paying. The fact of the matter is that domestic consumers, merchants and converters are of the opinion that this is still a buyers' market. They fail to realize that from now till peace obtains in Europe, we are in a sellers' market and the tightest and toughest sellers' market we have seen since 1916. The change from a buyers' market in paper to a sellers' market is the greatest transition that has taken place in the industry in a decade. Instead of all the small consumers in the country telling the mills what they would pay for a ream or roll of paper (as has been the practice for the past ten years), the time has come when the mills will tell consumers what they must pay for paper. In that lies the salvation of this industry.

In 1938, the National Paper Trade Association published its profits as being only one-tenth of one per cent for all the tonnage they moved that year. It was the most disastrous year profit-wise the merchants or mills ever had. It was the financial nadir in the merchants' history and the fitting culmination of a prolonged buyers' market.

It took another world war to turn the industry from a buyers' to a sellers' market. The sellers' market is here to stay till the end of the war whether consumers, merchants or converters of paper realize it now or not. America is being called upon to supply the world with a huge deficiency of paper and pulp, and while we at present are in a strong sellers' market, the time is not far distant when we shall be in the throes of a bidders' market just as we were in 1916.

Pulp and paper are world commodities just as wheat is. It is the world's demand that is setting the market.

The world demand is coming to the United States for its supply. We have only witnessed the beginning of that demand.

"SPRING UNLOCKS THE FLOWERS"

▶▶▶ SPRINGTIME is clean-up time. It is the one time during the four seasons of the year when a concerted effort is made in many communities to clean up and beautify the home grounds, alleys, parks, highways, and even industrial locations.

Schools and other local agencies often co-operate in this springtime activity. A definite program is planned, and the plan is put *to work* for a certain definite period. In this way, attention is focused on the organized effort with the result that much more is accomplished than would be possible without it.

Activity of this kind cannot be stressed too often. It is easy to overlook the importance of such a program. Unless proper emphasis is placed upon it, so many individuals are apt to just "Let John do it," and the burden actually may become so heavy to John that little if any good is accomplished.

Most pulp and paper mills are located in villages or in cities of comparatively small size. Often a mill is the most important means of livelihood of an entire community. Community spirit, therefore, frequently must emanate from the mill. If the mill has little interest in plant cleanliness, it is doubtful if the community as a whole will give much thought to appearances. If the mill sets the example by creating clean and pleasant surroundings, the community will benefit by it.

Perhaps there is another way for a mill to develop community interest in the appearance of its home town and that is to sponsor the organization of a men's garden club among its employees. Have you ever thought of such a possibility?

Most certainly, in the average mill organization, there is some employee who likes to garden, who enjoys plants, who may have had some garden club experience, who would welcome the opportunity of organizing a men's garden club of employee members only. Maybe you are such a garden enthusiast, and maybe not; but, if you are interested in a cleaner and prettier home community, why not see what can be done to stimulate interest among your mill associates and fellow employees in such an organization. You will find the effort both stimulating and profitable.

CURRENT THOUGHT

WILL GOLD BECOME CHEAPER?

WILLIAM SIBLEY

AUTHORITIES ESTIMATE that since Columbus sailed the terrifying waters of the Atlantic there has been produced in this world something like 41,000 tons of gold. If this quantity could be priced at the U. S. Treasury's peg of $35 per ounce, it would have a value of approximately $41,600,000,000. Much of this gold, of course, has been lost, but also much of the gold produced has been saved, because through the ages men believed in gold. This belief was based on centuries of satisfactory experience, it proving itself in this time to be the most satisfactory medium of exchange.

But the gold situation today gives promise and fearful warning that the price of gold will become far less than $35 per fine ounce. . . . Because dictators, devastation and despair have small regard for the beliefs of men however long entrenched. Consider this:

Gold production has been mounting steadily for the past several years. There is no indication of a lower production in 1940. So long as the European war continues (and as long as we continue our neutrality and our present policy of "cash and carry") the production of gold outside the United States and its Territories will become a basic industry, since it is with gold that belligerents pay for their munitions and supplies. Let us consider, further, the gold situation of today with the situation at the start of World War I, 1914.

In 1914, the United States had something less than two billion dollars in gold. This was about 30 per cent of the world's monetary gold. Of this amount, one billion three hundred million was in government hands. That was during 1914. Today, the United States Government owns more than eighteen billion dollars worth of gold. This is nearly 60 per cent of the world's monetary gold reserve. Of this amount none of it is in the hands of private citizens.

During the early years of the World War there was a strong movement of gold to London and Paris. Now, and even for the past several years (due to the darkening political situation) gold has been moving to the United States, and at a rate that exceeds three billion dollars a year.

During 1914 practically all of the powerful nations on earth were on the gold standard. Now these countries are on an inconvertible paper standard. The hope of these nations is that some day, at long last, they will be able to return to the gold standard, but since they are on a paper standard the gold is held on government lands. That is why the great majority of the three billions in gold that is today being imported to the United States is being put back into the earth. It came out of the earth—and now it is going back into the earth, but at a little town in Kentucky rather than Alaska, California or South Africa.

If the present importation of gold continues—if this burial of the precious metal continues in Kentucky the United States will very presently have a corner on the world's supply. And the little township in Kentucky will think itself a million times richer than the Kimberly diamond mines.

But here's where the influence of dictators, of devastation and despair come in. As the war that started in 1914 progressed the belligerents (and even non-warring nations) became poorer and poorer. They had to have money. They were too busy destroying lives and property to manufacture needed goods for sale, so they had to borrow. And they borrowed from the United States Government. They gave their paper as security. After the war, many of our European debtors found ways of reducing their war debts to practically 100 per cent of nothing by the simple expedient of repudiating the paper which had been considered payment for goods.

The 1940 War promises to be more devastating and more destructive than its earlier brother. That means the end will see the gasping nations far poorer than they were in 1918. The struggle for reconstruction will carry a greater measure of despair. And they will have no gold. Very few of the nations, save the United States will have sufficient gold to permit a resumption of the gold standard. And so, in their despair, what is to prevent them from repudiating gold then as they repudiated paper? All of our buried gold will have turned to brass so far as value is concerned. And—as in the former case, the United States would have paid largely for the war's cost.

Pretty thought—don't you think!

Fig. 1—General view of office and mill showing main entrance.

The importance of

A Clean, Safe Work Place

E. N. BARONET, Safety Director
Anglo-Canadian Pulp and Paper Mills, Ltd.

▸▸▸ THE CO-ORDINATION OF CLEANLINESS and safety promotes health and happiness. A well-kept plant has many times proved its worth as a silent salesman. Whatever the nature of the production, it is a known fact that a clean plant attracts more visitors, thus constituting a more widespread advertisement, and resulting in a greater volume of business.

The creation of a clean and safe work place has been the objective of most of the employees who have been making the Anglo-Canadian Pulp and Paper Mills, Limited, their home during the past thirteen years.

The plant is 850 feet long at its longest part and 580 feet wide at its widest part. It is under one roof, with the exception of the wood-washing building, which is connected to the main building by a housed log-conveyor bridge, 253 feet long, and the employment building which is near the main entrance of the property.

The plant has a very neat appearance with its elaborate roof cornices, artistically designed with concrete blocks of different shapes; but the most attractive part of the building is the 220-foot architectural tower which dominates the entrance to the harbor of the old city of Champlain. Before the declaration of war, this lofty mill tower was beautifully flood-lighted by night and could be seen far down the St. Lawrence River as an unofficial beacon to distant navigators as well as to the harbor fishermen in foggy weather. Concealed in the tower at the top is a water tank for fire protection, with a capacity of 125,000 gallons, which gives a normal pressure of 80 pounds per square inch on the ground floor throughout the plant. The tower is equipped with elevators to the very top.

The interior of the plant also has its welcome appearance, with considerable light being transmitted without glare through translucent reinforced glass in skylights and a properly distributed lighting system in all departments. The lighting throughout the plant is aided by the liberal use of white and cream paint on the ceilings and walls. More than 100 hand fire extinguishers of all descriptions are quite noticeable on the walls and columns. They are placed on shelves with a bright red stripe of appreciable width painted on the adjacent wall and column. Each kind of extinguisher is painted a different color, and the purpose for which it should be used is described on it. The dadoes along the lower parts of the walls and the columns are a dark green and the doors a dark red. All motor casings, bases of machines and woodwork are painted battleship grey. Before any painting is done, walls and columns are washed with a weak solution of soda ash, and repainting is done where it is found necessary. Although no definite painting schedule is planned ahead, the paint brush is always kept busy.

An untidy building is a danger to life, health and property. It might appear to certain people that time spent on cleaning is a non-productive part of operation and never ends because it has to be done over and over. Such a theory cannot be correct, since a clean, hygienic plant promotes safety, keeps insurance premiums at a low rate by reducing the causes of fire, and prolongs the life of the worker.

Just as a good house requires a solid foundation, so did the builders of this plant prepare for its long and progressive life. They selected part of the tidal flat on the north side of the St. Lawrence River, where, in November, 1926, 7000 concrete piles were embedded down to the solid rock to assure substantial strength for the foundation on which this splendid mill stands.

Fifteen years ago, the 97 acres of property where this plant is situated

Cleanliness promotes safety and safety eliminates fire hazards. Good industrial housekeeping is one of the valuable phases of operation. It is a short step from orderly-mindedness to safety-mindedness.

Fig. 2—Two of the paper machines. Note the asphalt strip in the aisle to provide safe walking.

was part of the river bottom—a long sandy beach where tides ebbed and flowed, rising as high as twenty-one feet. It was also a sanctuary for thousands of sea-gulls and other birds during the summer months. It took nearly 2,000,000 cu. ft. of sand, which was reclaimed from deeper water and pumped over two-thirds of this area, to form a sufficiently high and dry portion of land for the construction of what is considered a modern, safe working place for more than seven hundred people.

For those who had seen this place in 1926, it was a metamorphosis when they returned ten years later to find the long sloping beds of sand changed to beautiful green lawns with multicolored flower beds and a background of shrubs giving an impressive neatness to all visitors as they step through the plant entrance and follow the hardened cinder road stretching several hundred yards towards the main door of the building which contains the executive quarters and general offices where there is a staff of seventy persons. (Figure 1.)

The management of this plant always has considered good housekeeping one of the leading factors in promoting safety and fire protection. The workers have been taught this in such a way that it has grown into a habit with the years.

We do not intend to imply that we are advertising the cleanest plant in the paper industry. We are merely advocating the value of soap, water and paint for good housekeeping, and what an orderly plant means to the welfare and safety of its employees.

The modern fast paper-making machinery of today and the various products derived from the manufacture of pulp and paper have been a source of tremendous business and wealth to this country; and, like all other industries, it has its own particular manufacturing problems. Many of them involve various methods by which the cleaning is done. In our case great care has to be given to fourdrinier wires. They must be kept free from pitch, slime, and many other foreign materials. Also much care has to be given to calender rolls, screens of all description, save-alls and many other machines required for the manufacture of paper. All such cleaning is very essential to assure hign quality in the production of paper.

The cleaning of our newsprint mill is done by the clothing crew composed of six men. Floors are cleaned daily with a hot solution of caustic. This solution is prepared in a tank on wheels holding about 70 cubic feet, and is drawn off into pails through a tap which is fixed to the bottom of the tank. Rubber boots and gloves are used while this work is done because the men are subject to scalds. All moving machinery and dangerous places are cleaned during the week-end shutdown. Brass work and railings get their full share of polishing. Exposed shafts, couplings and belt pulleys, which are not dangerous and do not require guards, are kept polished with fine emery cloth. The basement in this part of the plant is cleaned daily by the regular cleaning crew composed of four men. Much care has to be exercised here because the floors become very slippery with oil, and this necessitates the use of strong oil-removing solutions and a high pressure of water to do this cleaning. A large number of motors and high-voltage panels are also exposed and could easily be sprayed by a false move of the cleaner. This would mean damage to the equipment and probably serious injury to the cleaner. It is found necessary to leave a man in this part of the plant to clean walls and columns that are at times covered with splashes of stock and oil. (Figure 2.)

The cleaning of electrical equipment is done by electricians. Whenever inexperienced laborers are required to work on electrical equipment, they are placed in charge of experienced electricians. There are approximately 800 motors of widely different power installed throughout the plant. These are inspected regularly by motormen on each shift. The bearings, casings and bases of these motors are also kept clean by these men. General electrical routine work is planned during the week and done during the shutdown

Fig. 3—Operating floor of mixing room.

at the week-end. Starters are inspected and oil changed. Oil is not allowed to remain in starters longer than six months in certain places. Where there is an excess of water around the motors, the oil is changed as often as every two months. Motors are overhauled and sprayed with lacquer when it is considered necessary. All mill feeders are tested for leakage every four months, and oil tests are taken once a month on our substation transformers. The changing and filtering of oil in the transformers is done when the test indicates that this is necessary.

The company employs a regular cleaning crew composed of five men, including a sanitary man and a window cleaner. The sanitary man is in charge of all locker rooms and sanitary work. These men are attached to the maintenance crew in the mechanical department and come under the supervision of the plant fire inspector. Their work consists of a general cleaning routine in the different departments throughout the plant, such as the mechanical office, engineers' quarters, drafting office, carpenter and pipe shops, tinsmith and welding shops, control department offices and laboratory, operating superintendents' office, and hospital floors. They also have to empty and clean all rubbish containers.

The operators in departments such as wood handling, sulphite mill, groundwood, mixing, stores and shipping attend to the cleaning of their respective departments on each shift. The store room with a capacity of approximately 800 tons is equipped with steel bins and shelves. The storekeeper on each shift takes care of his share of cleaning. The paper shed has a storage capacity of 2,800 tons. During the summer months the shed is often emptied and is then cleaned by the storage crew before refilling. (Figure 3.)

The steam plant crews clean their department, and also have the pump house to attend to. This place is frequently inspected by the man in charge of heating and ventilating. It is considered one of the main arteries of the plant since it contains three large centrifugal pumps, which deliver nearly 20 million gallons of water daily, and two smaller pumps of the same type with a capacity of 2400 gallons per minute. The latter are connected to the fire-protection system. Besides these pumps there is a chlorinating system, and electrical equipment to operate all of it. The boiler room contains two electric boilers and three 1250-hp. coal-fired boilers as well as air preheaters and considerable other equipment for the purpose of making steam. The normal cleaning here is really a question of good housekeeping for safety. There are steam plant hazards which have to be attended to, such as the accumulation of fine coal dust on beams and stringers, and allowing too much coal dust to be present in the air, which would exist when handling fine or run-of-mine coal with a very low moisture content. Under these circumstances there is always a possibility of a back flash when opening fire doors. Owing to the dusty condition of coal, windows have to be cleaned regularly so as to maintain proper light. This department also stands responsible for the cleaning of our Briner economizer system. There are four of them to each machine; and due to the fire hazard of paper dust or lint, it is necessary to prevent the accumulation of such dust.

Regular cleaning is maintained in the yard during the summer and winter months. Ten men, including two gardeners and two trackmen, form the yard crew. The company has its own locomotive and crane to take care of all incoming and outgoing freight. Six horses are required to remove rubbish and other discarded material from the building, and bark and wood debris from the chain conveyors in the log yard. These men are also responsible for the cleaning of the company's wharf, especially when coal is handled from boats at certain parts of the wharf, for it then becomes covered with lumps of coal, and walking becomes dangerous. Flexible landing ladders are also kept in good condition by them. The wharf is 1,350 feet long and is fitted to accommodate sea-going vessels and lake boats which dock there for the purpose of loading paper and unloading sulphur, coal and other materials required by the company. During the winter months these men are kept busy removing snow from the rail switches and different places in the yard where there is moving equipment. As the mill property stands completely open to all the winds that blow, sleet and snow hazards become very common through winter storms. A coating of ice is often formed on the steps of stairs going over log conveyors, and the roads are put in a dangerous condition. To overcome the danger of slipping, fine cinders are spread over the roads and places where men are working. Arrangements are made during cold spells in winter to serve hot coffee to the men who have to spend all their time in the open. (Figure 4.)

One part of the equipment which is very carefully inspected for cleanliness and efficiency is the plant fire protection apparatus. This equipment consists of two fire pumps, three manifold sets, four electric alarm systems, one steam-or-air siren whistle, 36 hydrants, 40 water-towers ranging from 20 to 40 feet in height, one harbor fire-boat connection, 4000 feet of standard fire-hose, two hose carts with a capacity of 500 feet each, and seven sprinkler air-valve chambers. This equipment is inspected every second day and kept clean by the six plant watchmen. All the piping for fire protection is underground, safe from frost trouble.

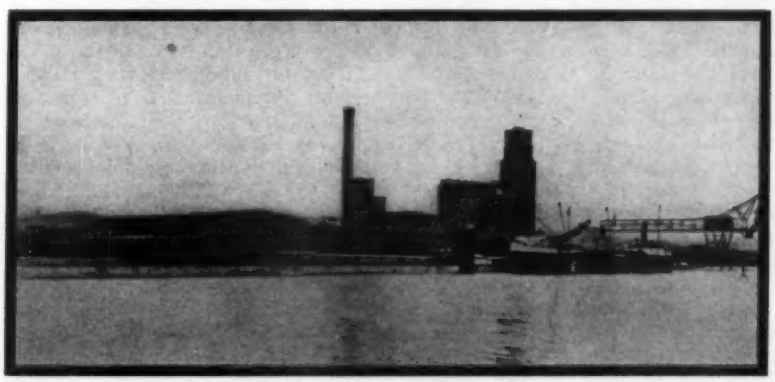


Fig. 4—Mill and wharf from the river.

If cleanliness is to be classed as one of the things that should come first in life, it should not be made a pension job in all cases. In many industries, men who are assigned to the jobs of watchmen and cleaners are much too old and frail. It is admittedly a humane act to provide work for those whose physique is below standard. Nevertheless, in the case of a watchman, physical fitness is required because we are dealing with a very serious problem. The workers' job and the company's property are entrusted to the watchmen; therefore, a competent watchman should be considered an important employee in any industry or institution. He is the man who stands between life and destruction.

The plant fire-brigade is composed of forty-eight men. These men are

(Concluded on page 145.)

Stainless Steel
in the Pulp and Paper Industry

JOHN H. FAUNCE, JR.
Manager Industrial Markets Department
The American Rolling Mill Company

▸▸▸ FOR THE PAST SEVERAL YEARS there has been a definite trend toward the usage of specialty metal equipment as a means of lowering production costs and improving the quality of pulp and paper products. This has partially been brought about because of the competitive situation which exists in the paper industry.

The stainless steels are comparative newcomers to the pulp and paper field but already they are contributing in a number of cases to increased pulp and paper production at lower costs with a maintenance or improvement of existing quality.

There are a number of different types of stainless steel, each with different characteristics. Because of this and the wide diversification of conditions that exist in pulp and papermaking equipment, it would be rather difficult in an article of limited scope to make any sort of general grade recommendations that would have any real meaning. However, it is possible to briefly discuss a few of the outstanding characteristics of the stainless steels, interpret these as to the benefits they have to offer, and describe a few of the existing installations as illustrative examples.

Without going comprehensively into paper mill applications, it is felt that this article might be helpful in clearing up the confusing picture of the stainless steels that has been encountered in talking to a number of paper mill men and equipment builders. This article will deal only with flat rolled stainless steel applications.

What the Stainless Steels Are

The element chromium is the alloying material on which all of the stainless steels depend for their major corrosion resisting properties. At the present time, we know of no other metal that can be added to steel in approximately the same proportions that will give similar results.

However, other elements are added to the chromium steels for the purpose of improving their corrosion resistance, physical properties, or both. Based on experience, it is believed that nickel, columbium, and molybdenum are the only other alloying elements that would be of any major concern to papermakers and their equipment suppliers for stainless steel sheet applications.

Nickel additions to the chromium steels help to increase their corrosion resistance in the presence of many of the organic chemicals and mineral acids, and help materially in the improvement of physical characteristics such as strength, shock resistance and ductility. Molybdenum helps to build up added corrosion resisting properties where the stainless steel are in contact with solutions containing such non-oxidizing acids as acetic, phosphoric, hydrochloric and sulfurous.

Columbium helps increase the general corrosion resistance of the stainless alloys in welded structures and those operating above 900 deg. Fahr. by liberating the chromium from carbides, thus increasing the amount of effective chromium present.

The stainless steels are commonly referred to by a series of numerical designation such as 17 chrome or 18-8. In all cases the single number of the first number of a hyphenated series designates the approximate percentage of chromium in the alloy. The second number, if there is one, gives the approximate percentage of nickel. For example, a 13 chrome stainless steel contains approximately 13 per cent chromium and the balance iron except for very small amounts of other elements. The 18-8 stainless steel contains approximately 18 per cent chromium, 8 per cent nickel, and the balance iron except for very small amounts of other elements.

Figure 1 (left); Figure 2 (right).

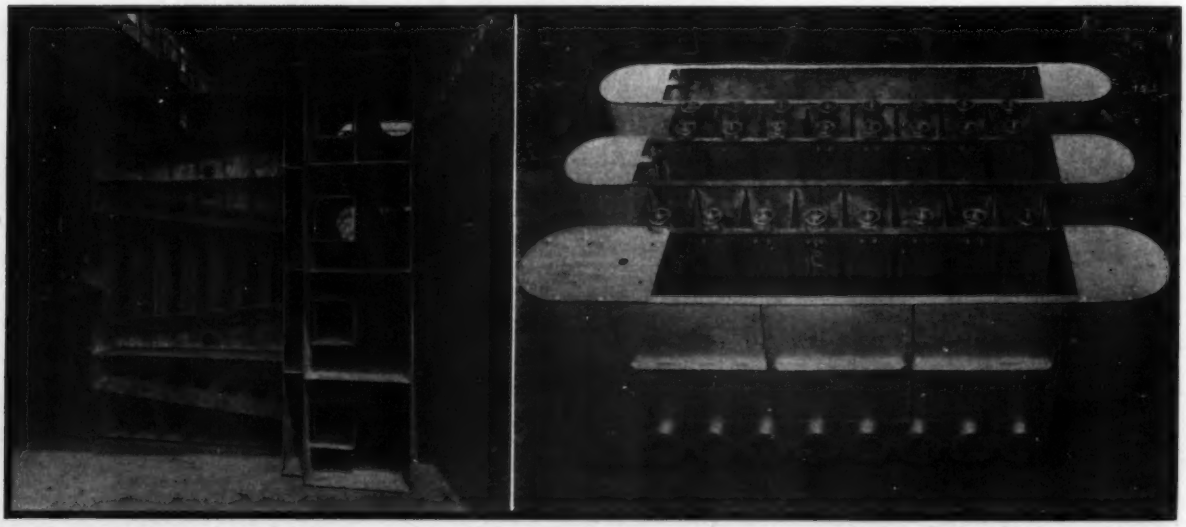
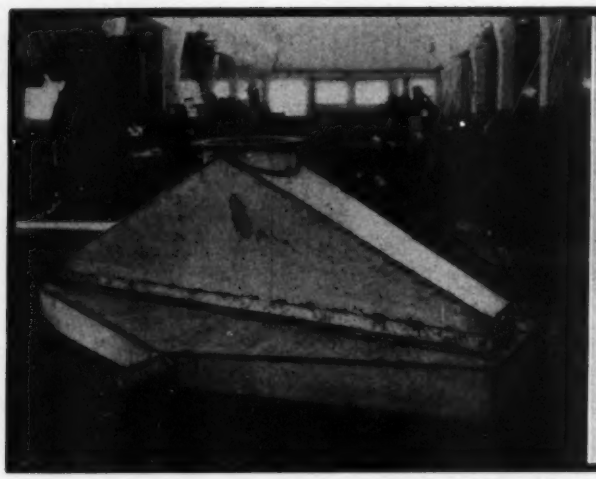


TABLE 1—Properties of Different Stainless Steels

ELEMENT	18-8 (Normal Carbon)	18-8 (Low Carbon)	18-12 Mo	19-12 Mo	13	17	18-10 Cb
Carbon	Over .08-.20	0.08 max.	0.10 max.	0.10 max.	0.15 max.	0.12 max.	0.10 max.
Manganese	1.25 max.	2.00 max.	2.00 max.	2.00 max.	0.45	0.30-0.60	1.50 max.
Phosphorus	0.03 max.	0.03 max.	0.03 max.	0.03 max.	0.03 max.	0.03 max.	0.03 max.
Sulphur	0.03 max.	0.03 max.	0.03 max.	0.03 max.	0.03 max.	0.03 max.	0.03 max.
Silicon	0.30-0.60	0.30-0.60	0.30-0.60	0.30-0.60	0.45	0.50	0.75 max.
Chromium	18.0-20.0	18.0-20.0	16.0-18.0	18.0-20.0	10.0-14.0	14.0-18.0	17.00-20.00
Nickel	8.0-10.0	8.0-10.0	14.00 max.	14.00 max.	.....	.....	8.00-12.00
Molybdenum	.....	.....	2.00-3.00	3.00-4.00	.....	.....	.....
Columbium	.....	.....	.....	.....	.....	.....	Min.10xCarbon
PROPERTY	**AVERAGE PHYSICAL PROPERTIES (Annealed Condition)**						
Ultimate Tensile Strength, lbs. per sq. in.	90,000	85,000	85,000	85,000	65,000	75,000	85,000
Yield Strength, lbs. per sq. in.	45,000	40,000	40,000	40,000	35,000	45,000	40,000
% Elongation in 2"	55-60	60-65	45-55	40-50	30	27	45-55
Modulus of Elasticity	29,000,000	29,000,000	28,000,000	28,000,000	29,000,000	29,000,000	29,000,000
Brinell Hardness Number	130-162	125-150	135-180	150-200	135-160	146	140-180
Rockwell "B" Hardness	75-85	70-80	75-88	80-90	76-85	77	70-90
Scaling Temperature, °F.	1650	1650	1650	1750	1250	1550	1650
Melting Range, °F.	2550-2590	2550-2590	2500-2550	2500-2550	2750-2790	2710-2750	2550-2600
Specific Gravity	7.93	7.93	8.03	8.03	7.65	7.71	8.02
Approx. Weight, lbs. per sq. ft. per in. thick (Use in estimating sheet and plate weights.)	42	42	42	42	41.2	41.2	42
Electrical Resistivity†	71-73	71-73	74.2	74.2	72	75	71-73
Grain Structure	Austenitic	Austenitic	Essentially Austenitic	Essentially Austenitic	Martensitic Ferritic	Ferritic	Austenitic
Specific Heat, cal./°C./gram	0.117	0.117	0.12	0.12	0.11	0.11	0.12
Thermal Cond. cal./sec./sq. cm./°C./cm.	0.048	0.048	0.041	.....	0.06	0.06	0.038
Thermal Cond. B.t.u./hr./sq. ft./°F./in.	139	139	120	.....	174	174	110
Coeff. of Linear Exp. per °F. (68°-212°F.)	.0000095	.0000095	.0000090	.....	.0000061	.0000064	.0000090
Coeff. of Linear Exp. per °F. (68°-932°F.)	.0000102	.0000102	.....	.....	.0000067	.0000067	.0000101
PROPERTY	**HEAT TREATMENT**						
Annealing	Quench from 1975°F.-2050°F.	*Quench from 1950°F.-2050°F.	*Quench from 1950°F.-2050°F.	*Quench from 1950°F.-2050°F.	Cool in Furnace from 1550°-1100°F. or Cool in air from 1350°-1400°F.	Cool in air from 1450°F.	Cool in air from 1975°F.-2050°F.
Forging	Start about 2100°F. Finish above 1700°F.	Start about 2100°F. Finish above 1700°F.	Start about 2100°F. Finish above 1800°F.	Start about 2100°F. Finish above 1800°F.	Start about 2100°F. Finish above 1400°F.	Start about 2000°F. Finish above 1400°F.	Start about 2100°F. Finish above 1700°F.
Hardening	Non-Hardening	Non-Hardening	Non-Hardening	Non-Hardening	Quench from 1800°F.	Non-Hardening	Non-Hardening
Tempering	Non-Hardening	Non-Hardening	Non-Hardening	Non-Hardening	Draw at 400°F.-1300°F.	Non-Hardening	Non-Hardening
Drawing and Stamping Properties	Very Good	Very Good	Good	Fairly Good	Fair	Good	Good
Machining Properties	Fair-Tough	Fair-Tough	Fair	Fair	Fair	Fair-Tough	Fair-Tough
Welding Properties	Very Good	Very Good	Very Good	Very Good	xFair	Fair-Brittle	Very Good

†Microhms per cent. cube at room temp. *Air quench satisfactory on material thinner than .10". xCan be annealed to soften.



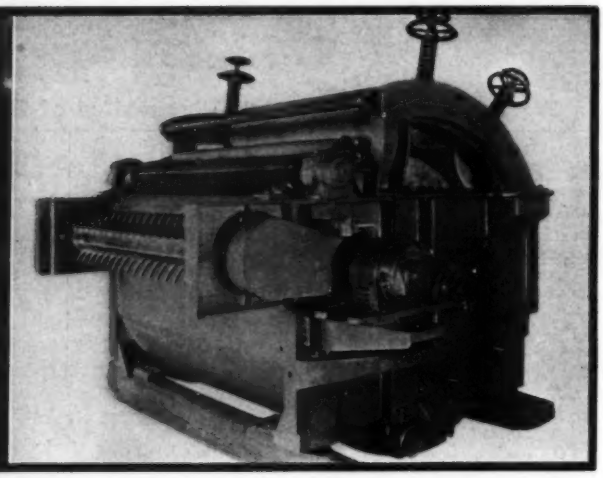


Figure 3 (left); Figure 4 (right).

Chemical symbols added to the name show appreciable quantities of other alloying elements. For example, 18-12Mo means the alloy contains approximately 18 per cent chromium, 12 per cent nickel, and an effective amount of molybdenum, plus iron and small amounts of other elements.

Generally speaking the stainless steels become stainless at approximately 12 per cent or more of chromium. This is an arbitrary designation based on experience. As far as pulp and paper-making equipment are concerned, we do not feel that it would be advisable to use a material, for any work where a specialty material is desirable, containing much less chromium than this.

Pulp and Paper Mill Applications

There have been a number of successful installations where the 13 per cent chrome stainless material has been used among which are bleach washers, distributing boxes, head boxes, save all trays, baffles and gates in stuff chests, undercurrent vats, dams, and paper machine vats in paper mills. From our observations it has not only been helpful to the user because of its corrosion resistance in the presence of wash water and paper stock, but it helps materially in cutting down on slime growth and accumulation.

It has been found that a certain amount of scale and surface roughness will occur with this metal but that it will not be objectionable except where the highest degree of cleanliness is desired. In these cases an 18-8 stainless steel has been used successfully for similar applications.

The 13 per cent chrome stainless steel has fairly good corrosion resistance and in addition offers excellent resistance to abrasion. This material is easily fabricated by conventional methods.

The writer has recently inspected some settling troughs made of a low grade specialty steel which have failed in a relatively short time in service. This type of service could well be served by the use of the 13 per cent chrome material. An installation for this application is now being made.

In some instances it has been found desirable to use the straight chromium material in conjunction with the use of 18-8. Figure 1 shows a stock regulating box in a board mill where the 13 per cent chrome stainless is used to handle filler stock with 18-8 being utilized for the liner stock.

At the present time there seems to be little use of the 17 per cent straight chromium grade of stainless steel. This type of material is only mentioned here as some mill engineers have expressed slight interest in it. Generally speaking, it has approximately the same physical characteristics as the 13 per cent chrome stainless. It does have better corrosion resistance and should offer greater freedom from scaling and help the mills have a cleaner product.

However, it would be the author's opinion that, where greater cleanliness is desired than is obtainable with the lower chromium content material, a chromium-nickel grade of stainless steel such as 18-8 should be used.

The 18-8 type of stainless steel is the best known and probably the most versatile grade. The nickel in this type of steel increases its corrosion resistance against paper stock, bleach

TABLE 2—Grade Suggestion Chart

Unit	18-8 (Normal Carbon)	18-12 Mo	13	Remarks
Bleaching Equipment—Acid		X		
Bleaching Equipment—Alkaline	X			
Beaters	X			
Bleach Washers	X	X	X	
Blow Pit Bottoms		X		
Blow Pit Target Plates		X		
Digesters—Acid		X		
Digesters—Alkaline	X			Lining of cone portion.
Diffuser False Bottoms	X			
Diffuser Lower Tier Linings	X			
Evaporator—Black Liquor	X			Lining for upper half, tubes and tube sheets.
Flow Boxes	X		X	
Head Boxes	X		X	
Inlet Manifolds			X	
Jordan Bars	X			
Knotters	X			
Paper Machine Vats	X		X	
Piping	X	X		Some mills and equipment builders prefer that a grade containing approx. 19% Ni., 3-4% Mo be used.
Regulating Boxes	X		X	
Save-Alls	X		X	
Stuff Chest Gates & Baffles	X		X	
Thickeners	X			
Undercurrent Vats & Flumes	X		X	

wash waters, white waters and other solutions containing small but important quantities of chlorides, sulphates, and other moderately corrosive reagents. In addition our experience has shown that this type of stainless steel presents and maintains a relatively smooth, clean surface in service. It seems to help greatly in reducing slime adherence, accumulation, and growth. This in itself presents opportunities for improved and cleaner products with lower production and maintenance costs.

The 18-8 type of stainless steel is at the present time being used successfully for stock regulating boxes, head boxes (Figure 2), jordan bars (3), dams in paper machine vats, paper machine vats, baffles and gates in stock chests, undercurrent vats (Figure 3), inlet manifolds, liners and tube sheets in black liquor evaporators, liners for the lower parts of the digester cone in sulphate digesters, washers, knotters, color carts, beaters making specialty papers, and has successfully withstood tests for false bottoms in diffusers and for lining the bottom tiers of diffusers. For this last named application one installation is now being closely followed. This has been in operation for several months and from all indications it appears that it will give excellent service.

The service life of false bottoms made of mild steel is usually only from twelve to eighteen months causing constant replacement. These failures are due to cracking caused by pitting between the perforations. It has also been found that the perforations in mild steel become enlarged by corrosion and probably some erosion. When they become too large it is necessary to replace these false bottoms in order to maintain the desirable screening efficiency in order to keep too large an amount of fiber from going to the black liquor evaporators.

The bottom part of the diffuser shells in many cases are pitting badly. Tests here indicate that stainless steel will help overcome this difficulty if that portion of the diffuser is lined with it.

There are a number of other miscellaneous uses being successfully made of 18-8 stainless steels, but the scope of this article will not permit their discussion.

It will be noted that there has been some overlap between the 18-8 and straight chrome applications and that each is reported successful. In many cases the grade is indicated by the specific service condition. Generally speaking it would be the writer's opinion that when there is any doubt as to the success of the application with the 13 per cent straight chromium alloy the additional cost of the 18-8 will probably be small on a percentage basis when all other costs of the manufacture and installation of a unit are considered. Consequently, the slightly additional cost could probably be considered as good insurance of the best of service with lower operating costs.

The 18-8 type of stainless steel has excellent fabricating characteristics and can be worked by practically all methods employed by sheet and plate workers.

A grade of stainless steel containing approximately 18 per cent chromium, 12 per cent nickel, and from 2 to 3 per cent molybdenum is most commonly used in sulphite pulp mills, and for bleaching equipment. This grade is sometimes referred to as 18-12Mo and other times as 18-8Mo.

Others have quite comprehensively discussed the exceptionally widespread usage of stainless steels of this analysis for sulphite pulping equipment (*1*, *2*) and the readers are referred to these articles for detailed discussion. Stainless steels are not at all new to those men in sulphite mills and those supplying equipment to them.

It has been found generally that 18-12Mo is quite satisfactory for the handling of either alkaline or acid bleached stock. Figure 4 shows a vacuum bleach washer lined with 18-12Mo handling hypochlorite bleached pulps. Stainless might also prove satisfactory for a number of the piping requirements for handling these stocks and for carrying white water from the bleach washers.

As far as the writer knows there have not been any extensive studies made for the large diameter stainless steel pipes. It would appear, however, that the stainless alloys should have much to offer for a number of piping requirements in both pulp and paper mills as these metals have excellent corrosion resisting properties and because the density and smoothness of surface, apparently inhibit slime accumulation and growth.

It is strongly recommended that paper mills and their equipment suppliers consult with the metallurgical staffs of reputable stainless steel manufacturers about installations on which they may be in doubt. Possibly some information already established, or the steel companies widespread metal knowledge, can prove helpful.

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A Clean, Safe Work-Place

(Continued from page 141.)

picked from among the mechanical department employees. They are drilled every month and they also make regular tours of inspection in small groups throughout the plant for the purpose of keeping themselves acquainted with any change that has been made and to report on the general condition of each department as it appears to them.

The employees are provided with lockers. All locker-rooms are equipped with showers, wash-basins, toilets and foot-baths. An antiseptic solution is supplied in each locker-room for the prevention of foot diseases. Lockers are inspected, cleaned and disinfected every two months, some disinfectant being left in each locker. This kills germs and leaves a pleasant odor.

A cafeteria is located near the center of the plant for the convenience of the employees. There is a cook and three helpers. More than one hundred meals are served daily. Refreshments of all kinds are always available.

The company has a hospital which is part of the plant building. It covers a space of more than two thousand square feet and is equipped to meet any emergency. There is a dressing room, a first-aid room, a surgical room, a dispensary, an X-ray room with a darkroom, a physiotherapy room, a doctor's office and a laboratory. The hospital is attended by a doctor and a nurse.

Success in respect to cleanliness and safety only can be obtained through good examples displayed by the leaders in each department, with an effort to create that co-operative spirit between employer and employee which is indispensable. It is the place and the duty of leaders to stand ahead in all things that concern their departments and the welfare of their men. By so doing, cleanliness and safety become a habitual attitude of mind with the worker.

It Pays to KEEP CLEAN

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▸▸▸ MAXIMUM PRODUCTIVE EFFICIENCY consistent with human limitation has long been an ideal in industrial plant design. Good lighting is definitely a part of this ideal. However, once an installation has been made good lighting is dependent upon just *one* often neglected factor—*maintenance*.

Maintenance consists essentially of replacing lamps, cleaning lamps and reflectors and otherwise keeping the lighting system at peak efficiency. This should be the centralized responsibility of the plant operating, or building and grounds department. If this responsibility is divided among various productive departments, it is too often neglected due to their preoccupation with production problems as well as lack of understanding of the importance of maintenance.

The gradual accumulation of dust and dirt upon lamps and reflecting surfaces is often unnoticed because it usually is uniformly deposited and thus cannot be seen by contrast with a clean surface. Workmen are not conscious of the decrease in illumination because of the low decremental rate. A good installation can depreciate to 50 per cent or less of its initial value, before it is realized that inadequate illumination caused by this depreciation probably is responsible for an increased number of rejects or the decreased production, greater number of accidents, headaches, etc.

The rate of decrease in light output of equipment varies greatly with the type of work being illuminated—that is, the quantity and type of dirt and fumes thrown into the air as well as the general cleanliness or atmospheric condition of the neighborhood. For this reason, the establishment of a cleaning schedule is not an arbitrary matter, but one which is determined by the aforementioned factors. The most satisfactory method of establishing a cleaning schedule is to have one of the new, small, portable light meters in the plant and make a periodic check of the illumination. As a general rule, when the lighting drops to two-thirds of its initial value, the equipment should be cleaned. This decrease includes depreciation due not only to dust and dirt accumulation but also to normal or inherent lamp depreciation. It will be found that once the length of time necessary for this decrease has been ascertained, re-checks are not essential. One variation is the increase in dirt collection in the winter period due to coal soot, etc., as compared with the summer time. This is particularly noticeable in departments of the plant that are relatively clean and where the bulk of the dirt is from the atmosphere rather than from local dirt in the department. Generally speaking, in extremely dirty locations the lighting equipment should be cleaned every three or four weeks. Under average conditions, a cleaning period of from two to six months will maintain the illumination at more than two-thirds of the initial value.

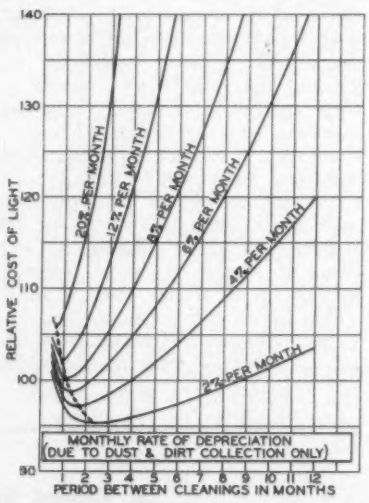

Fig. 1—Relation between cost of light and frequency of cleaning for various rates of depreciation. Variation of minimum cost cleaning period with various depreciation rates is shown by the dotted line.

Over-all Cost of Light

An analysis reveals that cleaning periods of from four to ten weeks, depending upon rate of depreciation, will result in a minimum over-all cost of light. Figure 1 illustrates the relation between the cost of light and period between cleanings for various depreciation rates. This chart is based upon average installation, operating and cleaning costs of an installation of 500-watt Glassteel Diffusers at a mounting height of 10 to 12 ft. It should be noticed that this analysis considers only depreciation due to dust and dirt collection and does not include normal lamp depreciation. The two factors do not necessarily decrease in proportion since lamp depreciation depends upon hours of operation while depreciation due to dust and dirt collection is principally a function of elapsed time. With some equipments the ratio of time on to time off will affect dust and dirt collection since air currents about the unit are difficult under the two conditions. The 100 per cent light output upon which the analysis is based is the average light output of a lamp and clean reflector throughout the life of the lamp.

Referring to Figure 1, it will be noted that the minimum point on the 8 per cent per month curve was chosen as the 100 per cent point. If the equipment is allowed to depreciate at this rate for eight months, the over-all cost of light increases 34.5 per cent. This accounts for the loss of light alone and does not consider the detrimental effect upon personnel and product due to decreased illumination.

The cost of cleaning depends upon the type of luminaires being cleaned, their location, and the personnel assigned to the work. In several plants in which such cost data are available, the average cost of cleaning open, porcelain, enamel, industrial reflectors at 10-ft. to 12-ft. mounting heights is 10 cents per reflector, with possibly a 10 per cent increase in the cost if the units are Glassteel Diffusers. With 18- to 20-ft. mountings, the greater difficulty of reaching the units raises the cost 15 to 20 cents per reflector. In high bays where a crane is available, the average cost is estimated at 30 cents per reflector, and where a crane is not available, and the climbing of building steel is necessary, it averages around 40 cents per reflector. However, as indicated by Figure 2, the cleaning cost is such a small proportion of the total that variations in this figure affect the cleaning period for most economical operation but little. For example, if the cost of cleaning is doubled from 10 cents to 20 cents, the period is increased only from 1.60 months to 2.23 months for a depreciation rate of 4 per cent per month. As would be expected, for more rapid depreciation rates, the cost of cleaning affects the period even less.

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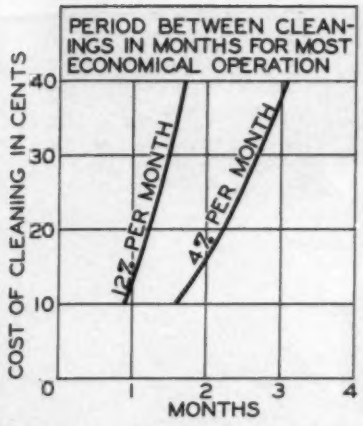

Fig. 2—Relation between cost of cleaning and most economical cleaning period for two rates of depreciation. (Dust to dust and dirt collection alone.)

Cleaning Methods

The actual cleaning is best achieved by taking the reflector down and washing it thoroughly with a detergent and warm water at the floor level. Since porcelain enameled reflectors essentially have a glass surface, alkaline detergents can be used in cleaning them. However, care must be taken in cleaning aluminum reflectors since an alkali will tend to attack the metal. Neutral detergents are recommended or even better a liquid wax or wax emulsions. These effectively remove the dirt and have the added advantage of leaving a thin film of wax on the surface which helps to retain the reflectivity.

Many of the new large-area, low-brightness, industrial units have a white casein base paint for a reflecting surface. This surface can be washed two or three times with mild soap and warm water. After these cleanings, however, the surface tends to lose its reflectivity and a fresh coat of paint should be sprayed on. After three or four coats have been applied, there is a tendency for the paint to peel away from the metal backing. At such time, the old paint should be scrubbed off and the process begun again. With a quality product, the metal backing is bonderized, so the paint surface is not essential for protection of the metal. In practice, the repainting is as easy or even easier than the cleaning. Cleaning also is simplified by the ease with which the reflecting hood can be removed without disturbing the wiring and lampholders of the unit. Thus the reflector sections can be removed for cleaning or painting to a location where the work will not interfere with other plant operations.

A common custom is that of wiping the reflectors with a dry cloth at the time lamps are replaced. This is extremely poor practice, particularly where there is greasy dirt which will adhere to the surface. Not only is it impossible to clean the reflector thoroughly in this way, but it is also inadvisable from the standpoint of the long life of the reflector. The grit and grime which remains after a number of dry wipings tends to form a permanent coating which cannot be removed in any way. Such a condition will not result if the unit is periodically and thoroughly cleansed. In addition to the possible damage to the reflector, tests have indicated that even with dry dust it is impossible to get thorough cleaning by this method. The author recently visited the heavy bag department of a paper bag factory located in the country. The dust from the product is relatively dry and free from grease. In the isolated location there is little dirt in the atmosphere. However, with a reflector which had just been relamped the previous week, and wiped with a dry cloth at the time, a 15 per cent increase in illumination resulted from a thorough cleaning with soap and water. A similar test in the carpenter shop of one of the largest paper manufacturers in the country checked this result quite closely. This plant has an excellent maintenance program. All of the reflectors in the plant are cleaned every three months. This particular test was conducted with equipment which had been cleaned about ten weeks before the time of the test. A dry wiping resulted in a 10 per cent increase in illumination. When the reflector was washed with soap and warm water, the illumination increased another 10 per cent, so that the over-all depreciation through this period had been approximately 20 per cent.

If this rate of depreciation is compared with Figure 1, it can be shown that even greater economy would result from more frequent cleaning. However, a three-month period suffices for satisfactory maintenance of the illumination, which is the most important factor. The savings indicated are actual and can be justified readily by the figures quoted. However, the principal value in maintaining illumination as close as possible to the initial level lies in the benefits to the organization which accrue from the improved lighting.

A survey of several papermaking plants brought out the fact that as a whole this type of manufacture affords more favorable conditions for good maintenance than industry in general. A number of tests were made which show approximately 27 per cent improvement in illumination after cleaning for the paper factories as compared with an average of 50 per cent improvement after cleaning for industry in general. However, even with such favorable conditions, it will be found that the most economical cleaning period is three months or less.

Disconnecting Equipment

Practically all the manufacturers of industrial lighting equipment list reflectors which easily and quickly detach from their mountings. Thus, the maintenance man can clean one reflector and carry it to the next position, leaving the first outlet vacant. Hanging the clean reflector on a hook on the ladder, while disconnecting the dirty reflector at this outlet, he hangs

Fig. 3—(left) An installation of automatic disconnecting hangers (as illustrated) enables the maintenance man to lower the fixture to the ground by means of a convenient chain. Upon pulling the fixture up again, it is automatically locked in position. (Inset is a close-up of the device.) . . . Fig. 4—(right) Telescoping platforms permit safe maintenance of high, inaccessible locations.

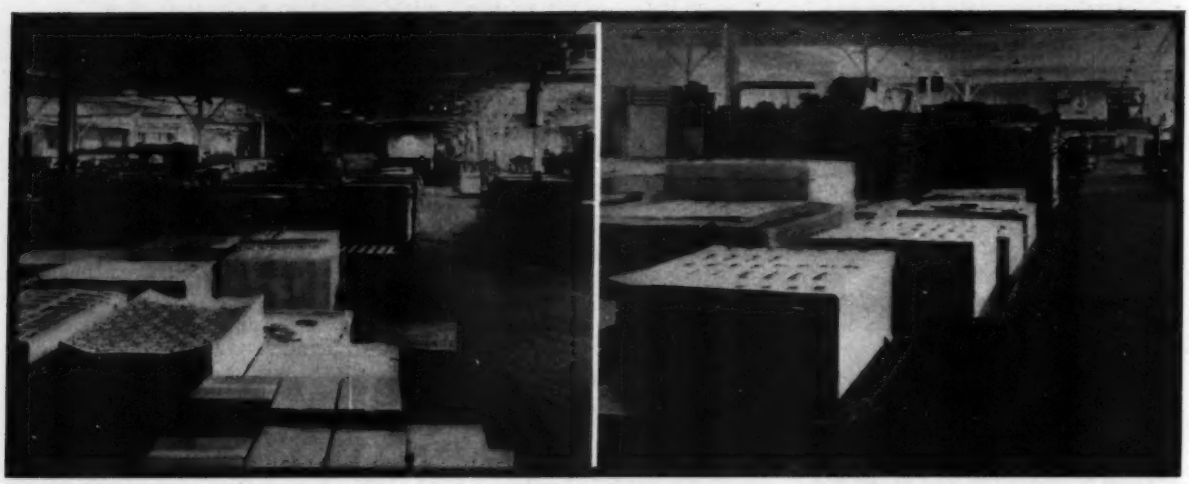

Fig. 5—Painting alone plays a prominent part in creating a pleasant working environment.

the dirty reflector on a second hook and puts the clean reflector in its place. He then returns to the floor, cleans the reflector and repeats the process at the next outlet. He finally replaces the last reflector in the first outlet to complete the entire job in much less time than is necessary if he ascends the ladder to each outlet twice.

Where a large number of reflectors must be cleaned, some type of cleaning truck is often devised. One plant uses a portable push truck which has three compartments, one for the cleaning solution, one for the rinse water and one for the clean rags. Both the cleaning solution and rinse water are kept hot with immersion heaters connected to convenient outlets at various locations throughout the area.

In addition to disconnecting husks for reflector equipment which facilitate the cleaning of easily reached luminaires, there are available automatic disconnecting hangers (Figure 3) which are particularly useful for mounting heights in excess of 12 to 14 feet. With such hangers the lighting units can be lowered to the floor level by means of a chain which is fastened to the reflector. Usually the chain is carried over to some convenient location where it is out of the way until needed. At such a time the reflector is loosened by a tug and lowered gently to the floor. The electrical contacts are broken when the reflectors are loosened. After cleaning it is pulled back into place where it automatically locks into position, reestablishing the electrical circuit to the lamp. Such devices are highly recommended not only because of the greater safety which they afford, but also the decreased cost of cleaning through the great decrease in time of cleaning.

Many plants have found telescoping platforms, such as illustrated in Figure 4 highly useful for the safer cleaning of lighting equipment as well as other types of maintenance which require access to high places.

Other aids to better maintenance are available, such as disconnecting hooks, which are an integral part of a cord connector set. With such a device the entire unit is quickly and simply removed for cleaning and easily replaced. In many plants the units are suspended from a hook and the electrical connection made by means of a flexible cord to a nearby outlet. Such devices serve very well for use with reflectors which are not equipped with disconnecting husks.

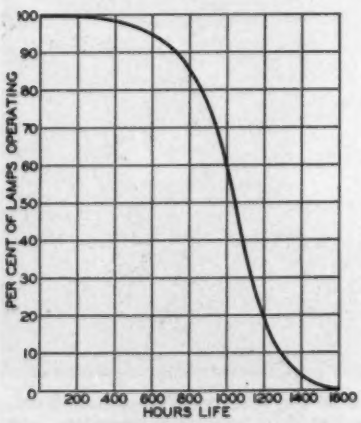

Fig. 6—Life expectancy of a representative group of lamps under good voltage conditions.

Interior Finishes

In addition to the care of lighting units, improved conditions can be obtained by frequent painting and cleaning of the surroundings—side walls, ceiling, and machinery.

In an average-size interior, illuminated with Glassteel Diffusers, having a ceiling and side walls with reflection factors of 30 and 10 per cent respectively a (condition which is quite common), repainting the ceiling so that it will reflect 80 per cent of the light striking it, and the side walls to a softer shade which will reflect 50 per cent of the light, will increase the illumination on the work approximately 15 per cent.

In a drafting room with indirect lighting where similar conditions might exist, painting to secure 80 per cent and 50 per cent reflection from ceilings and walls, will triple the illumination.

In addition to the increase in illumination due to light ceiling and walls, an appreciable improvement in the visibility of the scales of the dials of machine tools is derived from light-painted surfaces on the machine. Not only is more light reflected into shadowed sections of the machine but the mirror-like metallic dials reflect

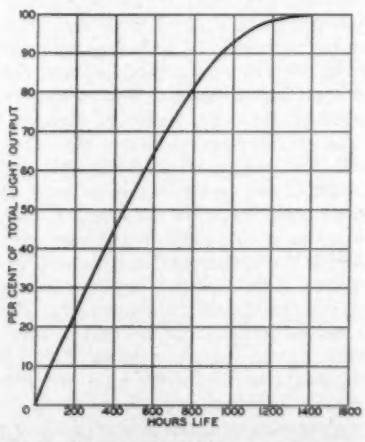

Fig. 7—Per cent of total lumen-hours output of a representative group of lamps operating in Glassteel Diffusers at rated voltage at various periods throughout life.

the adjacent light painted surfaces, thus increasing visibility. Companies which have adopted this plan, using very tough light cream, gray, or green paints, report little difficulty in keeping machines clean. Each man is responsible for his machine at the end of each shift and; consequently, the machines are continually cleaned of grease and dirt.

Repainting every few years can be justified from an economic point of view. However, this cannot be governed entirely by dollars-and-cents. Environment plays such an important part in the morale and productiveness of the employee that repainting should be done whenever the interior appears dirty and depressing (Figure 5).

Lamp Performance and Operating Voltage

The incandescent tungsten filament lamp is essentially a device to convert electrical energy into light. The best lamp is one which does this with maximum over-all efficiency based upon the factors of lamp efficiency, the relative cost of electricity and the cost of lamp replacement. True values are quite often slighted by the superficial appeal of lamps which merely "cost less" or "last a long time."

Lamp operating voltage is extremely important in obtaining efficient service, since a 5 per cent drop in voltage will result in a 16 per cent loss in light output. Lamp engineers have calculated very closely the various factors involved and thus have arrived at the design voltage rating of lamps at which maximum over-all efficiency is obtained.

Lamp Replacements

The most customary method of lamp replacement is to delegate some employee whose duty it is to replace lamps as soon as they have burned out. However, there are often ways in which greater economy of operation is afforded than by this method. At the time of cleaning it is usually desirable to remove the lamp and socket from the reflector. The lamp should be cleaned and inspected. If it is approaching the end of its normal life, which can be determined by examination or comparison with lamps of known life, it will be found more economical to replace it with a new lamp rather than return it to the outlet where it will operate only a short time.

Group Replacement—Many plants are finding the group replacement plan a convenient and economical method of relamping. The cleaning schedule is worked out so the lamps are approaching the end of normal life at some multiple of the period between cleanings. At that particular cleaning, which may be somewhere between 80 per cent to 90 per cent of normal lamp life, the entire installation is relamped, thus restoring the system to practically its initial efficiency. The old lamps are separated into two groups, one of which is so close to the end of life as to be of no further value; the other, relatively few in number, are longer lived and are set aside to replace the few early burnouts which will occur in the next group of lamps.

This plan has become practical due to uniform life which is obtained from a group of lamps. Lamp life, like human life, is necessarily based upon the average of a great number. However, there has been a great reduction in the variation from the mean so that a group of lamps operated at the same voltage will have a mortality curve similar to the illustration (Figure 6). It should be noted that at 80 per cent life, 84 per cent of the lamps are still operating. Also, since lamps depreciate in light output throughout life due to the deposit of tungsten on the glass bulb, this group of lamps in typical reflecting equipment at 80 per cent life has delivered 82 per cent of all of the light which it can be expected to deliver, despite the fact that only 16 per cent of the lamps have burned out. The illustration (Figure 7) indicates the percentage of the total possible light output which has been obtained at any period throughout life.

The group replacement plan can be used effectively in relatively large areas when the voltage conditions and hours of use are such that all of the lamps are approaching the end of life together. The advantages of this plan are: (1) Few burn-outs during critical working hours; (2) decreased labor cost of lamp replacement; and (3) restoration of the installation to essentially initial efficiency at definite intervals.

Special Service Lamps

There are many locations throughout the pulp and paper industry where excessive vibration causes standard lamps to burn out quickly and render unsatisfactory service. There are several specially designed lamps that will give good performance under extremely difficult conditions. The first of these is the rough service lamp for use where severe shocks and bumps occur, such as with extension cords and similar applications. It is available in the 50- and 100-watt sizes and in higher wattages for special applications. It should *not* be used for vibration service.

Where lamps are subject to excessive vibration, a special 50-watt vibration lamp has been especially designed to withstand high frequency vibration, such as produced by high speed machinery. It is not recommended for horizontal burning or for those operations where shock is inherent. One paper manufacturer has found that 56-watt, 115-volt lamps, especially designed for street railway service, stand up better for use in supplementary units on his machinery than do vibration lamps. It should be noted that with all these lamps of special design for a particular service, the light output is not as great as with standard lamps. However, because of the annoyance of replacing standard lamps frequently the special lamps are widely used.

In many cases, particularly where higher wattage lamps are in use, vibration can be minimized to a great extent by the use of shock absorbing hangers or sockets. In some cases the lighting equipment can be relocated to avoid these conditions.

The benefits of good illumination are many, and far outweigh the cost of any lighting system which is recommended. However, the plant engineer rightly considers lighting as a physical adjunct to the plant, subject to the same type of analysis as the other elements of the pyhsical plant. For this reason, a careful study of lighting in each department is recommended in order to make the most satisfactory installation and that proper attention may be given to the system once it is installed.

Contributions to Chemistry of Plant Cell Wall

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▸▸▸ IN MICROCHEMICAL STUDIES of wood, the usual thickness of sections is from 10 to 15 microns. It has recently been found practicable, using a very sharp knife at a vertical angle of 8 deg., to prepare sections 5 microns in thickness, or in the case of red spruce to a minimum thickness of 3 microns.

Such material when treated with 72 per cent sulphuric acid, or Schweitzer's reagent gives coherent structural residues differing greatly in pattern from those resulting from similar treatment of thicker sections.

Since it has already been shown *(1)* that secondary walls of fiber tracheids of temperate climate dicotyledons fail to give coherent residues when acid treated, even in sections 20 microns thick, attention was focused upon coniferous species where such residues occur. Three species, viz: eastern white pine (*Pinus strobus*), ponderosa pine (*Pinus ponderosa*) and red spruce (*Picea rubra*) were selected, and sections 5 microns or less in thickness were cut from small blocks of dried sapwood, aspirated in cold distilled water.

The behavior of very thin wood sections treated with 72 per cent sulphuric acid and Schweitzer's Reagent

That the residues obtained upon acid treatment, or with Schweitzer's reagent were quite different from those of thicker sections may be seen from the accompanying illustrations. When sections of coniferous wood 10 to 15 microns in thickness are immersed in either of the above reagents, the summerwood secondary cell walls, being thicker and with less room for internal expansion, rupture the "compound middle lamella" network and break up the structural continuity in this region (Figure 1). In the springwood, by contrast, there is more room for internal swelling; the secondary walls are much thinner and structural continuity is usually preserved (Figure 2).

Treated *thin* sections develop the peculiar patterns shown in Figures 3, 4, and 5. Besides differences in pattern, it will be noted that the continuity in the summerwood is preserved and that this region does not show the disorganization typical of thick sections.

It might be supposed that the thinner the section, the more fragile it would be when treated with polysaccharide dispersing reagents. However, the reverse seems to be the case, and the best explanation at present is that in the thinner sections there is more of an opportunity for the expanding secondary walls to swell upward or downward, and hence they exert less lateral pressure. In any event they become detached from the primary wall and twist about like short pieces of rope (Figures 3, 4, 5).

As might be expected from previous studies *(2)*, Schweitzer's Reagent, being less violent, produces fewer of the structural features just mentioned than does 72 per cent sulphuric acid. In this study, however, it is shown that:

1) Section thickness may be important in interpreting the results of microchemical studies on wood.

2) In the conifers sampled, complete disintegration of the secondary walls in acid treated sections does not occur even at thicknesses of 3 to 5 microns.

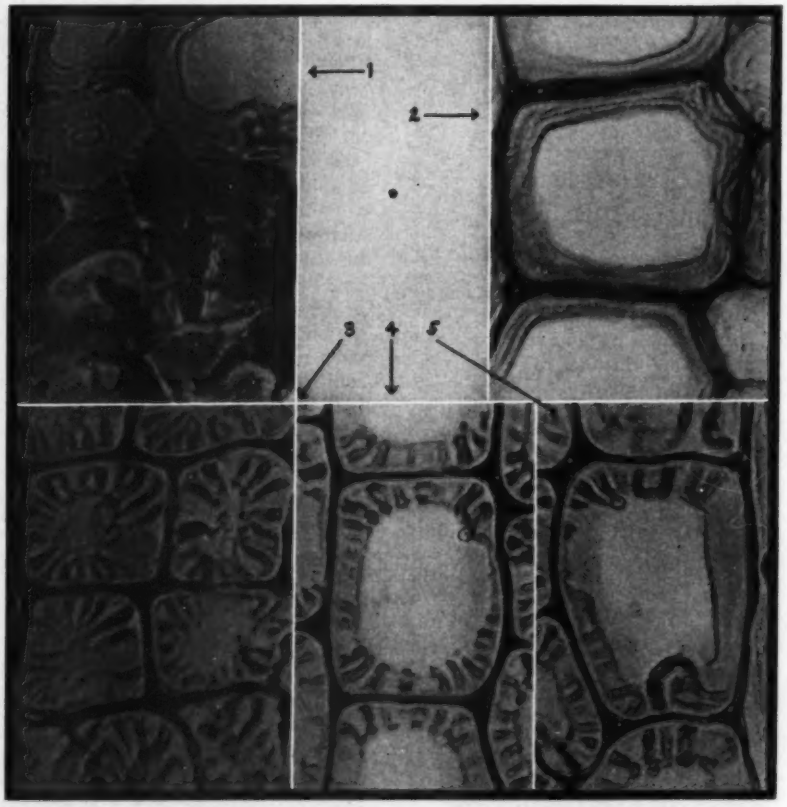


Fig. 1—Transverse section of white pine summerwood (lower portion of illustration) 15 microns thick, immersed in 72 per cent H_2SO_4 (600X).
Fig. 2—The same of springwood (600X).
Fig. 3—Transverse section of white pine summerwood, 5 microns thick, immersed in 72 per cent H_2SO_4 (600X).
Fig. 4—The same of springwood (600X) (note spiraling of detached secondary wall on left side of large cell).
Fig. 5—The same of springwood, showing portion of secondary wall still attached to the primary wall, on right side of large cell (600X).

Literature Cited

1) Harlow, W. M. *Tech. Pub.* No. 24, N. Y. S. College Forestry, 1933.

2) *Paper Tr. Jour.* 109: No. 18, 1939.

PAPER SKETCHES

FOUR YEARS AND FOURTEEN DAYS
WAS THE TIME 14TH CENTURY GERMAN PAPER-MAKER'S APPRENTICES WERE REQUIRED TO SERVE BEFORE BECOMING JOURNEYMEN WORKERS. THEN THEY WERE OBLIGED TO PROVIDE A FEAST OF ROAST CALF TO THE PAPER MAKERS OF THE NEIGHBORHOOD, ANSWER QUESTIONS, AND FOOT THE BILL FOR A THREE DAY DRINKING FESTIVAL . . .
PAPER
DRINKING CUP MANUFACTURE BECAME "BIG BUSINESS" DURING THE WORLD WAR WHEN AMERICAN OFFICERS, CHARGED WITH RUNNING HUGE TRAINING CAMPS, INSISTED ON PROVIDING THEIR MEN WITH INDIVIDUAL DRINKING CUPS.
THE FAD OF CIGARETTES ROLLED IN PAPER
WAS BROUGHT BACK FROM RUSSIA BY BRITISH OFFICERS RETURNING FROM THE CRIMEAN WAR IN THE 1850'S
WHEN A RICH MAN DIES IN CHINA, A PAPER REPLICA OF HIS MOTOR CAR IS MADE, CARRIED IN HIS FUNERAL PROCESSION, AND BURNED TO PROVIDE HIM AN AUTOMOBILE WHEN HE GETS TO HEAVEN!

ALLIED

PURVES WIRE GETS TWO NEW WIRE PATENTS

Andrew Purves, president and general manager of the Purves Machine Wire Company, Holyoke, Massachusetts, has been granted two patents on fourdrinier wires.

The principle of one of the patents is to insure a flat edge and is a protection against cracking, etc., a processing method which has been in use at the Purves plant for some time. A further patent covers a finishing process which completes the process in practically a single operation. This latter method of finishing wires has also proved extremely satisfactory.

◆

"COLOR GUIDE"

The International Printing Ink Division of the Interchemical Corporation is distributing a new and more comprehensive "Color Guide" to printers and papermakers at present.

IPI's new guide is not an ink specimen book but rather a practical reference chart for use in selecting colors and appropriate color combinations. It contains 108 colors which, it is felt, will meet successfully every need of the average printer.

The 10 by 12 book is bound with a cellulose cover and has white plastic binding. The cover is a reproduction of a Kodachrome transparency made especially for IPI by Morris Rosenfeld, marine color photographer.

The book contains information explaining the three-dimensional color designations by which each swatch is identified in the guide. These swatch numbers are not formula numbers but correspond to the three visual dimensions by which color is accurately defined. Readily understood charts are provided to explain the manner by which these notations were reached.

By utilizing these charts, a simple method of determining suitable color relationships is possible. For example, as the text explains, two colors to be used for type matter and background respectively should have sufficient value contrast to insure visibility. A safe practice in this case is to allow at least thirty points of difference in color value. The printer can easily follow this simple rule by selecting his colors by observing the value numbers shown beneath the color swatches in the guide.

Every color in the guide has been graphed by the spectrophotometer in the IPI research laboratories, so that should the physical sample fade, the exact record of the color will remain available indefinitely.

Several interesting facts about color popularity were brought out in the survey conducted by IPI in making up the new book. For example, it was discovered that printers want more samples of brown. Hence, the new IPI Guide contains 18 brown swatches in contrast to twelve brown swatches in the preceding guide. Similar revisions have been made to include more reds and blues in this guide.

◆

VERMONT INVITES CASEIN MFRS.

Vermont, through its Agricultural and Industrial Products Commission, is undertaking a study looking toward the manufacture of high grade casein at several co-operative milk plants. Two Boston engineers have been in Vermont during April making a survey of the possibilities of this project.

Dr. F. C. Atwood of the Atlantic Research Laboratories, Newtonville, Massachusetts, did not vouchsafe an opinion as to possible Vermont production but he felt that this leading New England dairy state could enjoy a better share of the sixty to seventy thousand pounds annual casein consumption in the paper and other industries if the quality of its product was improved.

New England produces half of its annual requirements, obtaining the rest by Argentine imports, Dr. Atwood indicated. Some is imported from Wisconsin and California. Color fastness and elimination of odor can be achieved by proper processing which would make the native casein salable to paper and paint manufacturers who will not touch the present unrefined product.

◆

PATENT RIGHTS ACQUIRED FOR SYNTHETIC RESIN

The Resinous Products and Chemical Company, Inc., Philadelphia, has announced the acquisition of rights to the United States patents of the Department of Science and Industrial Research, London, England, on the use of synthetic resins as acid and base exchange compounds. Commercial application has already been established in Europe, although no units are in operation in the United States at present. Synthetic resin water softeners were offered in 1938 under the corresponding German patents by the *I. G. Farbenindustrie*. These softeners have met with considerable success, it is claimed. It is reported that several plants have been built and are operating satisfactorily.

◆

INTERNATIONAL NICKEL EXPANDS W. VA. PLANT

Plans have been approved for improvements to the Huntington (West Virginia) plant of the International Nickel Company, it was announced recently. About $132,000 will be expended.

The program calls for an additional car-type electric heat treating furnace, erection of a brick building, and extended facilities for the chemical and physical laboratories. The new building will permit concentration under one roof of metallurgical and physical testing equipment as well as technical personnel, now temporarily located in various departments.

Stainless Steel Corrosion Resistant

BOLTS, STUDS NUTS, SCREWS

Today's high paper standards require the use of corrosion resistant bolting materials . . . for which VICTOR offers a complete manufacturing service for all types *special* Bolts, Studs, Nuts, and Screws of stainless steels, heat-treated alloys, non-ferrous metals and carbon steels. Made to any material specification and size requirement.

Also manufacturers of VICTOR *Heat-treated Alloy Steel* Studs for high pressure, high temperature piping. Made strictly to A.S.T.M. specifications.

Write today for the complete VICTOR Catalog and quotations—try VICTOR Service!

VICTOR PRODUCTS CORP.
2651 Belmont Ave. Chicago, Illinois

We'll gladly send you an illustrated catalog describing the many new and outstanding advantages of this new line of Crane Valves for high pressure services. Write today—use the coupon.

CRANE

1940 our 85th YEAR

CRANE CO., GENERAL OFFICES
836 S. MICHIGAN AVE., CHICAGO
VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

CRANE CO.,
836 S. Michigan Ave., Chicago, Illinois
Without obligation, please send me a catalog on the new line of Crane Small Steel Valves. PI & PW—5-40

Name .....
Company .....
Address .....
City ..... *State* .....

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

▶▶▶ PACIFIC MILLS, LTD., is erecting a new office building on the property now occupied by the head offices and paper converting plant on the waterfront, Vancouver, B. C.

◆

▶▶▶ IN ORDER TO TAKE care of increased business activities, the Western Precipitation Corporation, Los Angeles, has opened a new sales and engineering office in the Marquette Building, Chicago. A. W. Robinson will represent Western Precipitation for its entire line of equipment including Cottrell electrical precipitators, multiclones, poly-clones, Impex separators, spray and dispersion dryers. Mr. Robinson has been associated with the Los Angeles company for many years and has had long experience in the installation of both electrical and mechanical equipment for the control of industrial dust, fog, fume and mist.

◆

▶▶▶ THE CLEVELAND TRAMRAIL ERIE COMPANY, distributors in Erie, Pennsylvania, and surrounding territory for Cleveland Tramrail overhead materials handling equipment, has moved to 1731 Oxford Street, Erie. H. M. Nelson is manager of the office.

◆

▶▶▶ ACTING AS A CLEARING HOUSE between United States manufacturers and Brazil is the Alnameric Machinery Corporation, of New York City, agent for Alnorma Soc. Machinaes, Ltd., Rio de Janeiro and Sao Paulo, Brazil. The New York organization states that the Brazilian company has a large staff of competent engineers and that both main offices are equipped with demonstration halls where machines are kept in stock. The Alnorma company imports and distributes machinery throughout Brazil.

◆

OAKITE CO. INTRODUCES NEW PRODUCTS

Several recently-developed and improved cleaning materials were reviewed recently at the annual spring technical sales conference of the Northeastern and Philadelphia Divisions of Oakite Products, Inc., held in New York City, April 4-5. Attending the two-day session were over forty Oakite field service representatives together with members of the company's technical and service staffs.

Commanding great attention at the conference was the Oakite solution-lifting steam gun which is especially designed for such work as cleaning fourdrinier wires, cleaning wires on cylinder machines, cleaning interior and exterior surfaces of beater boxes and cleaning machinery for maintenance or before overhaul. Other topics discussed at the conference were: removal of scale from equipment, cleaning rubber-covered suction press rolls, washing felts and cleaning save-alls.

▶▶▶ A NEW THREE-STORY brick building has been erected by the Robins Conveying Belt Company at its Passaic (New Jersey) plant. The building will house the company's executive, engineering, sales and other departments. Previously the company maintained offices in the Park Row Building, New York City. A New York sales office will be maintained at 70 Pine Street in New York City, although the main offices will all be located at the New Jersey address.

S A F E T Y

▶▶▶ A FURTHER AID TO SAFETY at the Kalamazoo Vegetable Parchment Company takes the form of a new station wagon, especially equipped for first aid work, which is now in use at the Parchment (Michigan) mill. The station wagon is furnished with a stretcher and other items and will be used for emergency calls in both the mills and Parchment community.

◆

CANADIAN ASS'N REPORTS LOWER ACCIDENT RATE

The accident frequency rate in both woods and paper mill operations, severity of accidents and costs, all reached a new all-time low it was announced at the twenty-fifth annual meeting of the Ontario Pulp and Papermaker's Safety Association, held April 4 in Toronto.

The large plant trophy for safe operations was awarded this year to the Sault Ste. Marie mill of the Abitibi Power and Paper Company while the trophy for smaller plants was won by the Thorold division of Provincial Paper, Ltd., which had a perfect record of no lost-time accidents in 1939.

Succeeding W. S. Barber as president of the Association is A. T. Whealy of Corrugated Paper Box, Ltd. T. E. Silver of Abitibi was elected vice president and D. B. Chant, secretary.

◆

▶▶▶ A CELEBRATION WAS HELD on April 3 by the operating staff of the Thorold (Ontario) division of Provincial Paper Ltd., on the occasion of the presentation of the Class B trophy for the "Safest Mill in Canada" contest for 1939. J. N. Stephenson, editor of the *Pulp and Paper Magazine of Canada* made the presentation.

The Paper Industry Safety Contest

July 1, 1939 to June 30, 1940

Out of 178 mills reporting for February, 13 have perfect record

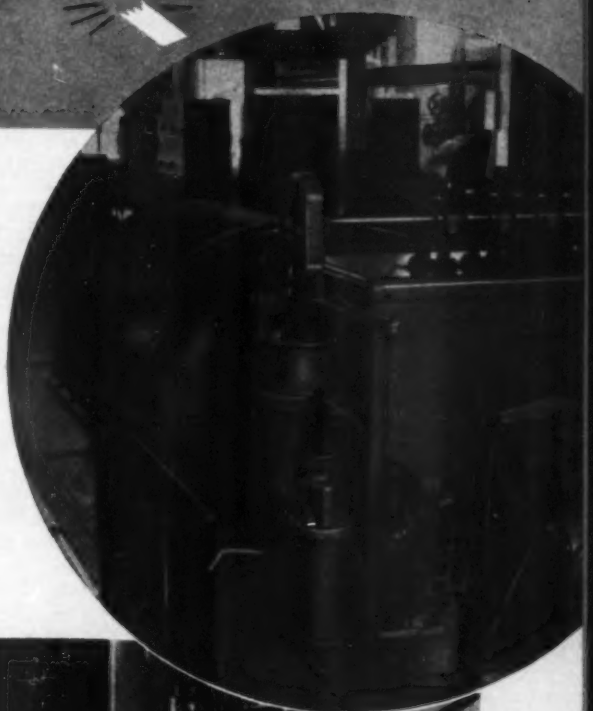
PERFECT SCORES

Division I—Pulp and Paper Mills

PARTICIPANT	MILL	LOCATION
GROUP A		
GROUP B		
GROUP C		
Strathmore Paper Co.	Woronoco	Massachusetts
American Writing Paper Corp.	Linden Div.	Holyoke, Mass.
GROUP D		
The Mead Corporation	Sylva Paperboard Co.	Sylva, N. C.
Bird & Son Inc.	Phillipsdale	Rhode Island
Crown Zellerbach Corporation	Crown Willamette Paper Co. Div.	Lebanon, Ore.
Spaulding Fibre Co., Inc.	Milton	New Hampshire
United States Gypsum Company	North Kansas City	Missouri
International Paper Co.	Livermore No. 11	Livermore Falls, Me.
The Mead Corporation	Nashville	Tennessee
Hollingsworth & Whitney Co.	Abenaquis Mill	Madison, Me.
International Paper Co.	Riley No. 23	Riley Me.
Spaulding Fibre Co., Inc.	Hayes	New Hampshire
Division II—Paper and Board Re-Manufacturing		
Bay West Paper Co.	Green Bay	Wisconsin

3 SHIFTS WITHOUT A *Break*

NEW REGULATING SYSTEM PROVES ITS STABILITY IN OPERATION AT SOUTHLAND MILL



WITHIN 10 days after starting at Southland Mill, three six-hour shifts without a break were observed.

Here, despite load swings of as much as *3000 kw* slammed on the power plant by intermittent grinder operation in the wood room, the speed showed hardly a traceable tremor at the paper machine. This means a smooth flow of continuous power is maintained at the paper machine despite heavy fluctuations elsewhere in the plant.

A BIG IMPROVEMENT

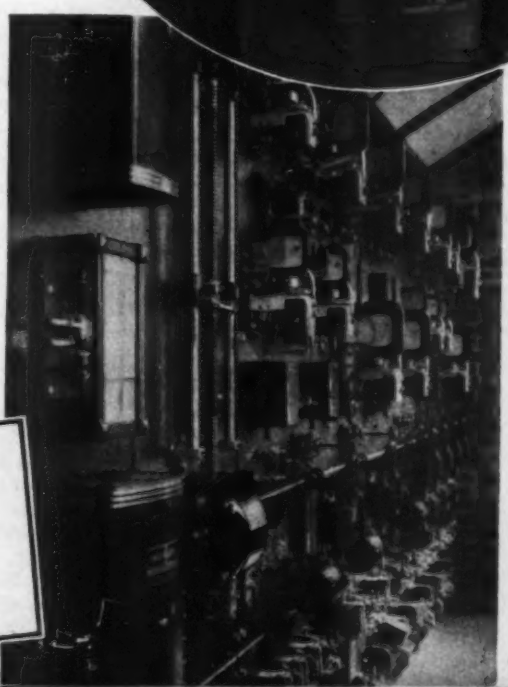
Only a few years ago, sudden variation of this much in plant load (equal to 25 per cent) would have wrecked the web on the paper machine. By expert application of advanced designs of voltage regulators, tied in with the operation of turbine-generator, motors and control, this achievement of keeping voltage stable (and speed constant) at the paper machine is made possible and practical. It is all the more remarkable in that the grinder motors are unusually large, whereas the blocks of power generated are of ordinary amounts—making a variation of 3000 kw a large proportion of the total generated.

Equipment for new accuracy and stability in speed regulation and in voltage regulation is but one of the systems and improvements engineered by General Electric in its unrivaled experience and co-operation with paper and pulp mills and with machinery manufacturers. For information on electrical applications, get in touch with the G-E office near you, stating the specific requirements at your mill, or write to General Electric, Schenectady, New York.

Pusey and Jones paper machine and G-E sectional drive (foreground) in Southland Mill, Lufkin, Texas

In Circle:
Two G-E turbine-generators, and G-E switchgear generate and feed power to the complete plant, including grinders and paper-machine drives.

Voltage regulator and control panel at Southland Mill →



G-E EQUIPMENT AT SOUTHLAND MILL

Paper-machine Drive
Switchgear
Pyranol Power Transformers
Turbine-generators
Winder Drive

GENERAL ELECTRIC

ASSOCIATIONS

GROVER KEETH SPEAKS BEFORE THE MIDWEST POWER CONFERENCE

▸▸▸ THE MIDWEST POWER CONFERENCE, held April 9-10 at the Palmer House, Chicago, attained the highest general attendance of its existence and showed a fifty per cent increase over last year. The Conference, sponsored by the Armour Institute of Technology, in co-operation with several Midwest colleges and universities and several local and national engineering societies, was attended by over 600 engineers, educators and professional men.

Representing the paper industry at the Conference was Grover Keeth, chief engineer of Marathon Paper Mills, Rothschild, Wisconsin. Mr. Keeth presented an interesting paper on a very pertinent subject, "Paper Mill Power," excerpts of which appear herewith.

"It is evident from present day development and quality requirements, that the power load has already exceeded the ability of the heat load to absorb by-product steam when the steam is produced at such pressures as were available when many existing mills were built. In selecting a suitable pressure and temperature, each plant has a unique problem which can only be solved by extensive studies. In our case, we have made a heat balance for pressures all the way from 150 pounds to 600 pounds. Also we have cost estimates for these several pressures and for voltage changes on the electrical side. These studies show us that 40 per cent of the steam required is used by the digesters, 15 per cent in bleaching pulp, 3 per cent in the preparation of the pulp for the paper mill, and 42 per cent in the drying of the paper sheet. In our case, there is a seasonal variation of 35 per cent in the amount of steam required. This can readily be appreciated when it is known that we must keep the mill running with outside temperatures as low as 35 degrees below zero. The electrical distribution for the abovementioned departments is as follows:

Wood Department	7%
Pulp Mill	26%
Beater and Jordans	32%
Paper Machines	22%
Fresh Water Pumps	8%
Miscellaneous	5%

"Electrical demands are fairly constant once the mill is started, so that the problem of meeting peak loads, such as faces the central station, does not play an important part in paper mill power. The most upsetting situation to many of us in Wisconsin as far as the electrical end is concerned, is the hydro power plant. This is caused by the extreme variation in output of the average low head hydro plant and it is most upsetting to any heat balance which we have been able to work up. Some improvement in this respect has been brought about by a rather extensive reservoir development on our northern rivers.

"Going back to the matter of steam, we find the steam plants built in the last few years have raised the level of initial pressures and temperatures for general use in the industry. The process pressures may be roughly divided into three broad steps. The top step used for digester cooking, high temperature processes, and other special uses is 100 lb. to 125 lb. (This pressure precludes the bleeding of steam from turbines when supplied at boiler pressures below 300 lb. and also the use of the steam accumulator for supplying digester steam.) The intermediate step, 10 to 30 lb., is used for dryers and special purposes, including building heat in severe weather. The low step is 2 to 5 lb. and is used for heating process and boiler feedwater, and for building heat. The specific pressures in each step depend on the product and processes of the individual mills.

"This would mean then that a turbine having two bleeding points, 125 lb. and 25 or 30 lb., would take care of process requirements, but what about the generator end of this machine? The first snag we run into is the hydro plant, and the next one is whether it is better to produce these additional kw. by steam going into the condenser or to buy them from the power company. Our conclusion has been to base our design on the firm power output of the hydro plant, discharge a minimum into the condenser of a bleeder turbine, and buy the remaining energy. There still remains the problem of voltage which we have answered in one of our mills by creating load centers which are supplied at 2300 volts. By so doing, we have avoided the expense of replacing motors and kept down copper size.

"A satisfactory paper mill boiler plant must be able to follow a rapidly fluctuating steam demand. . .

"Due to losses in condensate (obviously the direct use of steam in the raw materials for cooking, bleaching, etc., consumes water) the amount of make-up water to the boilers is high. This puts more solids and dissolved salts into the boiler, which increases the carryover of water and solids with the steam when the load increases sharply.

"The boilers should be designed to handle water with high concentrations and still produce clean, dry steam. They must be above all, reliable. A forced shutdown of the plant may spoil large quantities of material in process and disrupt production schedules with consequent losses in plant earnings. Almost the entire plant depends on steam for its operation, and when the steam supply stops, even for a few minutes, the plant cannot operate.

"One problem in the pulp mill, which has held back the development of the recovery of by-product heat, has been the inability of ordinary metals to withstand rapid corrosion caused by chemicals used in the process. Recent developments in chromium alloys are making available many types of equipment which originally could not be used."

◆

CONVENTIONS AND COMING EVENTS

May 14—Wisconsin River Valley Safety Conference, Wisconsin Rapids, Wisconsin.

May 19-20—National Paper Box Manufacturers' Association, Twenty-second Annual Convention, Coronado Hotel, St. Louis, Missouri.

May 23—Thirteenth Annual Fox River Valley and Lake Shore Safety Conference, Marinette, Wisconsin.

June 18-20—American Pulp and Paper Mill Superintendents Association, Annual Meeting, Netherland-Plaza Hotel, Cincinnati, Ohio.

Aug. 20-23—Technical Association of the Pulp and Paper Industry, Fall Meeting, Seattle, Washington.

Oct. 7-11—National Safety Congress and Exposition, Stevens Hotel, Chicago.

Dec. 2-7—Fourteenth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City.

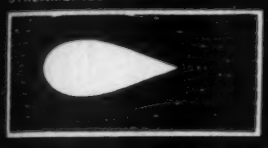
Practically as simple in Operation as

FLOW THROUGH A STRAIGHT PIPE

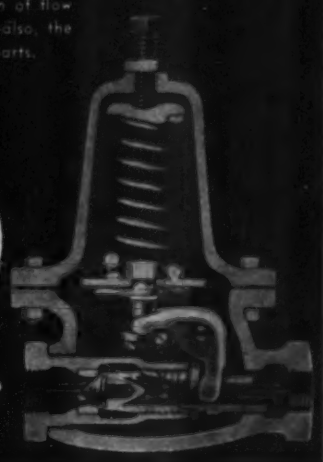
The Straight Line Flow eliminates turbulence, giving highest valve capacity. From inlet to outlet the fluid flows through this valve in a straight line—a streamline—almost as though there were a pipe running through the valve housing for the fluid to flow through. There is no detour around a dividing wall—the direction of flow is not changed at right angles because of a seat wall—also, the flow is not broken up by valve stems, springs, or other parts.

THE VALVE INCREASES PERFORMANCE RESULTS — BY ELIMINATING ORDINARY VALVE TURBULENCE LIKE THIS

. . . AND GIVING YOU STREAMLINED FLOW LIKE THIS



THE INNER VALVE FITS RIGHT IN THE LINE AS THOUGH A PART OF IT



WHAT THE *Streamlined* FLOW MEANS TO YOU . . .

Because of the Streamlined Flow—and No Turbulence, you are easily able to meet peak demand and yet hold the reduced pressure constant at the same time. Supply line pressure may change; demand may change—you still have smooth action, close dependable regulation. You experience no spoilage results due to erratic pressure—because the reduced pressure never varies.

What Some Users Say

Installed three years ago—
No one has ever touched them—
Mighty good—intend to buy more—

"It must be three years since we installed four or five of your Streamlined Regulators. The last I heard of them they were holding pressure the same as when we first installed them. And as far as I know, no one has ever touched them. They are mighty good, and we intend to buy more of them."
Case No. 345.

High capacity—
Accurate regulation—
Tight closure when not in use—

"I have telephoned our operating departments to ascertain why they have so persistently specified your '1000' Valves these past four years. All give me the same reasons: (a) the accuracy with which the Valves hold the pressure on the low side; (b) unusually high capacity; (c) ability to always close tightly when not in use."
Case No. 350.

Simplicity—
No trouble from dirt—
Respond quickly—shut tight too—

"General simplicity. Have had too much trouble with pilot operated valves the moment that dirt comes along. Your Valves have no ports to gum up. They shut off tight too, and respond quickly whenever machines are cut in or cut out. I have listened to a lot of talk about dead-end but your Streamlined Valve is the first place I ever saw it. They have been shutting off perfectly and do not build up at all."
Case No. 352.

CASH STANDARD

Streamlined TYPE 1000 PRESSURE REDUCING VALVE

★ That the Streamlined (Type 1000) Valve stays on the job and gives you one cost saving benefit after the other is proved by statements from users such as those reproduced here. These users tell you exactly as we do, that you have no failures with the Type 1000, that you get longer service, that your dollars buy you more in production results, that you are easily able to meet peak demand and yet hold the pressure constant at the same time, and that over maximum service periods, maintenance expense is practically zero.

Now, Mr. Valve User, here's why you can experience exactly the same results—there are no complicated parts to get out of order—no small ports or passages to clog up—the rugged construction is obtained with fewest possible working parts—there are no close fits—and remember, there is straight line flow all the way.

The high pressure entirely confined to the small inlet chamber (cross hatched section) makes this valve good for initial pressures up to 3000 lbs. For delivery pressures below atmosphere a special diaphragm spring arrangement is used.

You may select a CASH STANDARD Streamlined Valve exactly suited for your service conditions. Bulletin 1000 shows how. Any combination of metals can be obtained for body, trim, valve seat, and seat ring. Handwheels for quick pressure adjustment also available.

Steam, air, water Capacity Charts for all Streamlined Type 1000 Valves

These charts in Bulletin 1000 are easy to use. They enable you to determine precisely how much fluid any size Streamlined Valve will deliver under your exact pressure conditions—for Steam, Air (and other gases), Water (and other liquids).

Free TRIAL

Try this Valve in your plant. No red tape. Just say "Ship on 30 days' free trial." After 30 days we send you a bill. You pay it; or you return the Valve at our expense. No strings attached. You are the sole judge. Why not order one Valve on trial—today?

SEND FOR BULLETIN 1000

A. W. CASH COMPANY
DECATUR, ILLINOIS

CASH STANDARD
CONTROLS . . VALVES

Dark green slime spot in 30-lb. green bond paper. Enlarged 30 times. Courtesy Messrs. Murray M. Rubin and Milton L. Rubin.

Slime's a nuisance all year round in many mills, but it's in the spring and summer that slime is at its worst in almost all mills.

If you've been messing around with hand operations, you know how much it costs you—and how poor the results are.

There is one sure, easy and inexpensive way to lick this slime situation.

MAGNUS SLIME REMOVER

circulated through the entire system, eliminates practically all hand cleaning work, because it penetrates and loosens all deposits, making them non-adhesive. More—it kills the bacteria and fungus growths that cause slime deposits. It converts *all* slime constituents to a stable, finely divided emulsion which rinses off quickly and *completely*.

End that slime and "seconds" partnership and reduce your slime removal costs to the low level where they belong, with Magnus Slime Remover.

ASK FOR PAPER MILL PERFORMANCE DATA

covering experience with Magnus Slime Remover and other Magnus Paper Mill Specialties.

MAGNUS CHEMICAL COMPANY

Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emulsifying Agents and Metal Working Lubricants

192 South Avenue Garwood, N. J.

MAGNUS CLEANERS

MICHIGAN DIVISION ENTERTAINS LADIES

"To the Ladies" . . . . . might well have been the most appropriate toast on the evening of April 20 at the Park American Hotel in Kalamazoo, Michigan, when 180 members and guests of the Michigan Division of the American Pulp and Paper Mill Superintendents Association attended the division's annual ladies' night dinner dance.

The affair has been enjoyed by increased members each year with this year marking an all-time high for attendance.

Following the dinner, Chairman Lester Liberte welcomed the ladies and guests and explained that the Hawaiian leis presented to the ladies as favors preceding the dinner entitled them to rule the evening. The men were presented with false noses, mustaches and colored glasses so that, 'twas said, they would be able to see any situation in the right light. After this presentation Mr. Liberte introduced the toastmaster of the evening, Walter Hadley of the Sutherland Paper Company, who, in turn, introduced National Secretary Robert Eminger, Past National President, F. L. Zellers and E. J. Thom, who sat at the speakers' table. Mr. Hadley also introduced Mrs. Paul Fortier, whose husband was a former Michigan Division member.

As a feature of the evening Walter Z. Harris and his assistant Ed. Russey entertained the guests for thirty minutes with feats of magic. Music for the dancing following the entertainment was provided by Hyrtie Ghysels Orchestra and featured the lovely voice of Virginia Ghysels. Music during the dinner hour was furnished by the roving accordionist, Earl Clason.

Following the entertainment program each lady was presented with a gift from the Michigan Division. The gift consisted of paper specialties manufactured in Kalamazoo Mills.

◆

APPA SURVEYS STANDARDS FOR PAPER TESTING

The standard prescribed conditions for paper testing in the industry have received considerable study by the Technical Association of the Pulp and Paper Industry. For some years these standards have been 65 per cent relative humidity and 70 deg. Fahr. After its extensive study, the Technical Association solicited the help of the American Paper and Pulp Association, and the Executive Committee of that body is conducting a survey to draw opinions from men in the industry who are well versed in such problems. They have been asked to answer the following questions:

1) Does your company presently use 65 per cent or 50 per cent relative humidity for (a) routine testing, (b) selling of paper according to specifications?

2) If 50 per cent were adopted as the new standard by the entire industry, would such a change cause you embarrassment or difficulty with the distribution of your products?

3) If 50 per cent relative humidity were adopted as the new standard for TAPPI after general approval by the American Paper and Pulp Association, would you prefer to: (a) change to the new basis, or (b) remain at the present standard of 65 per cent?

◆

SUPTS. LOOK FORWARD TO 21ST MEETING

The members and associates of the American Pulp and Paper Mill Superintendents Association are looking ahead to the twenty-first annual convention and exhibition with pleasant expectancy. This gathering will be held at the Netherland Plaza Hotel, Cincinnati, Ohio, June 18, 19 and 20.

All details of the arrangements have not been announced, but those in charge promise papers that will be highly interesting and most helpful. Likewise, there is assurance that the entertainment features will be in line with the attractions usually enjoyed at these meetings.

It is announced that instead of the Tissue Group holding its usual sessions, those interested in tissue will be taken to Middletown, Ohio, where they will have an opportunity to go through the plant of the Crystal Tissue Company, after which a round table meeting will be held.

The exhibition is always one of the highlights of the superintendents meetings and it would seem it will be as important this year as before. Most of the exhibit space has been sold and this assures a fine display of the most up-to-date developments in papermaking equipment and supplies.

The Netherland Plaza is one of the finest hotels anywhere, and as all public rooms are air-conditioned, those who attend will be able to sit through the sessions in perfect comfort. It is necessary, however, that those who plan to attend the meeting make their hotel reservations early. Those wishing to make reservations at the Netherland Plaza should address their reservation direct to the hotel.

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MIAMI VALLEY PAPER MILLS

ATTEND THE

21ST ANNUAL CONVENTION

AND

EXPOSITION

Largest 1940 Display of Paper Mill Machinery, Equipment and Supplies in U. S. A.

THE AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Inc.

NETHERLAND PLAZA HOTEL

ALL PUBLIC ROOMS AIR-CONDITIONED

JUNE 18-19-20

NAMES *in the* NEWS

Personals

TWO GOODRICH MEN RECEIVE 30-YR. PINS

In commemoration of a thirty-year service record with the B. F. Goodrich Company, Chester F. Conner and E. Peterson, sales promotion manager of the mechanical division, and manager of paper mill sales, respectively, were presented with service pins by J. H. Connors, vice president in charge of the mechanical division.

Mr. Conner, a graduate of Buchtel college in Akron, joined the Goodrich

E. Peterson

company in 1910 as a sales correspondent. He was made Boston district manager in 1916 and in 1923 returned to the sales promotion department in Akron, being made sales promotion manager of the mechanical division in 1930.

Mr. Peterson is well known to paper and pulp mill men. He joined the Goodrich organization in 1910 and was made a member of the company's sales staff four years later. His business career was interrupted by the World War when he enlisted in the U. S. Army Engineering Corps. Mr. Peterson returned to Goodrich in 1919, becoming connected with the mechanical division sales staff. He has held his present post since 1929. He is a member of TAPPI.

Chester F. Conner (left) receives thirty-year service pin from J. H. Connors, vice president in charge of mechanical division, B. F. Goodrich Company.

N.S.C. STAFF CHANGE

A change in staff personnel at the National Safety Council, Chicago, has just been announced. J. L. McEnnis, Jr., has resigned as associate editor of *Public Safety* to become director of public relations for the Northwestern University Traffic Institute.

Succeeding Mr. McEnnis is Frank M. Richardson, who leaves the *American Lumberman* where he has been associate editor.

◆

▶▶▶ Now a vice president of the American Writing Paper Corporation of Holyoke, Mass., is *Edward C. Reid*, who has been associated with the company since its reorganization in 1937. Mr. Reid was elected to the executive post at a meeting of the board of directors on April 18, at which time all other officers were re-elected.

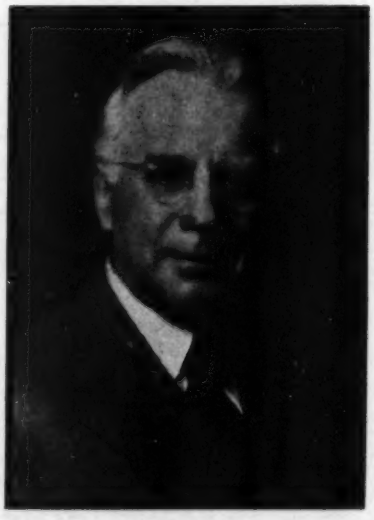
◆

FRANK G. HALL 50 YEARS WITH STEIN, HALL & CO.

"From Office Boy to President" might well be the title of the biography of Frank Griswold Hall, president of Stein, Hall and Company, manufacturers and distributors of starches, gums and dextrines. Mr. Hall celebated his fiftieth anniversary with the well-known company on April 6, at which time officers and distributors of the New York concern tendered him a banquet at the Waldorf-Astoria.

Mr. Hall was hired as office boy a half-century ago. He rose from that lowly post to stock clerk, salesman and finally partner. He became president of the company in 1918 when Stein, Hall and Company was incorporated.

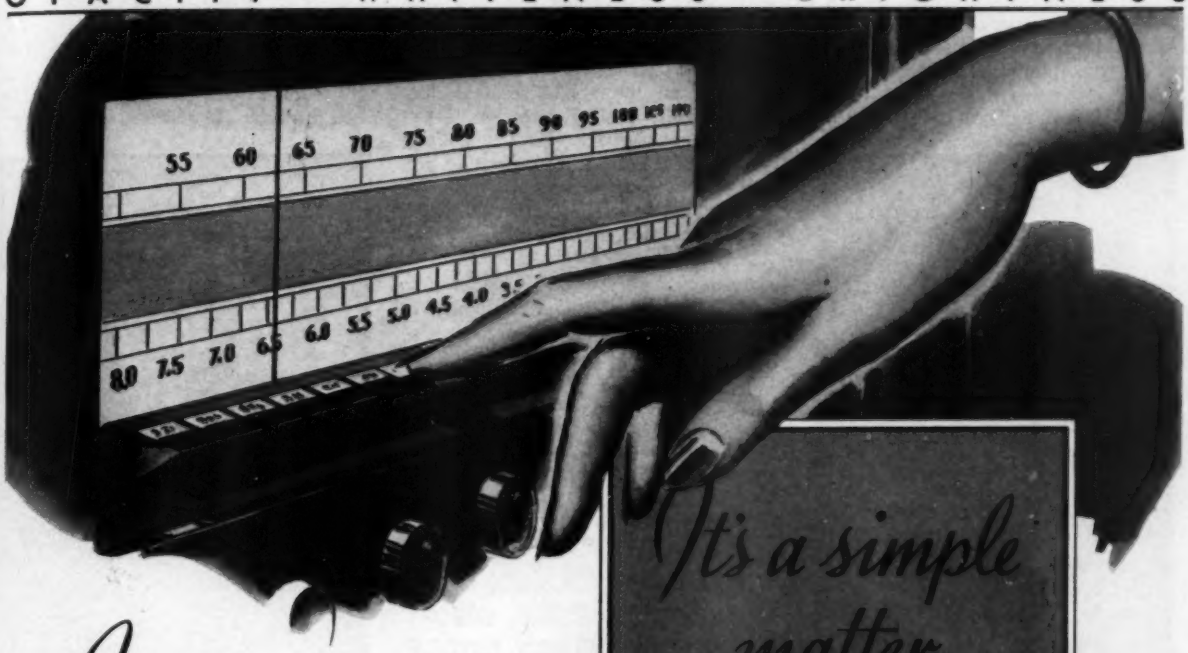
Mr. Hall received numerous gifts from company officials and distributors in addition to hundreds of congratulatory messages. A unique feature of the banquet was the reproduction on the menus, of Mr. Hall's original



Frank G. Hall

letter of application for the job of office boy, under which was printed "He's Got The Job." Toastmaster of the affair was Arthur L. Strasser, the company's general counsel.

OPACITY • WHITENESS • BRIGHTNESS



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TITANOX-A (pure titanium dioxide), most opaque of all white pigments, produces these three desirable characteristics with minimum pigmentation. TITANOX-B-30 (titanium barium pigment) as a filler or coating pigment, and TITANOX-C (titanium calcium pigment) for coating, have distinct advantages in opacity over ordinary white pigments. All these TITANOX products are exceptionally white and bright, have uniformly fine particle size, and are chemically inert. Their wide adoption by the paper industry indicates their particular adaptability to paper making processes.

Our Paper Service Department will gladly assist you to obtain the maximum value from TITANOX pigments.

Cooperation. When a doubt appears in your mind regarding the proper TITANOX pigment for a given paper product, communicate with our Paper Service Department. Or if any problem arises in relation to the use of TITANOX pigments under any condition, bring it to headquarters. We are pleased to give full cooperation in technical problems. As the originators of titanum pigments, with a background of twenty years in studying and developing them, we are able to advise you with authority.

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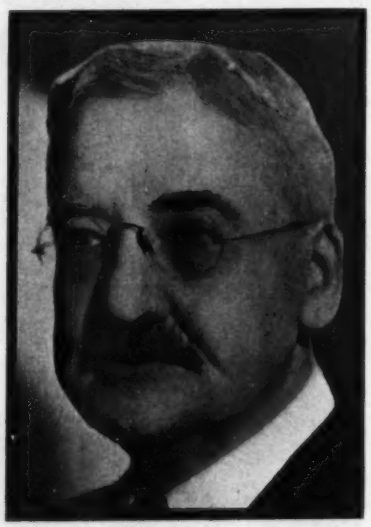
ALFRED HARRIS IS EIGHTY YEARS OLD

The entire Harris-Seybold-Potter organization held open house on April 17 for its employees and their families. The occasion was the eightieth birthday of Alfred F. Harris, chairman of



Alfred F. Harris

the board and co-founder of the Harris-Seybold-Potter Company, Cleveland.

In connection with Mr. Harris' birthday anniversary a commemorative booklet—a birthday greeting from the employees to Mr. Harris—was presented to the chief executive. In it was written a two-page tribute to Mr. Harris and to his brother, Charles, co-founder of the company, who is no longer living. In it also is reference to the "Modern Pioneer" award recently tendered Mr. Harris by the National Association of Manufacturers for his development of the method and machinery of the offset lithographic method of printing (cf. THE PAPER INDUSTRY AND PAPER WORLD, p. 1230, March, 1940).

In addition to tendering birthday greetings to Mr. Harris, the booklet contains pictures of the first Harris offset press and the original Harris factory at Niles, Ohio. Pictures of the company's present plants at Cleveland and Dayton (Ohio) are also included. From 1,200 to 1,500 people took part in the open house celebration in honor of Mr. Harris.

◆

▶▶▶ Now sales manager of the plastics division of the Carbide and Chemicals Corporation is *George C. Miller,* who has been associated with the division since the early commercial development of "Vinylite" resins.

▶▶▶ Associated with the paper mill department of Stein, Hall and Company, Inc., New York City, *Rolland D. Smith* has been appointed New Orleans branch manager to succeed Hugh J. McKane who was fatally injured in an automobile accident last January (cf. THE PAPER INDUSTRY AND PAPER WORLD, p. 1200, Feb. 1940). Mr. Smith is a graduate of the University of Michigan. He was formerly connected with the French Paper Company, Niles, Michigan.

◆

▶▶▶ *David J. Crikelair,* well known in Pacific coast paper marketing circles, has been appointed Pacific coast representative for the L. L. Brown Paper Company, Adams, Mass. Mr. Crikelair was formerly associated with the Los Angeles division of the Zellerbach Paper Company and in his present position will maintain headquarters in Los Angeles.

◆

CAMERON SENDS MAN TO CALL ON WEST COAST MILLS

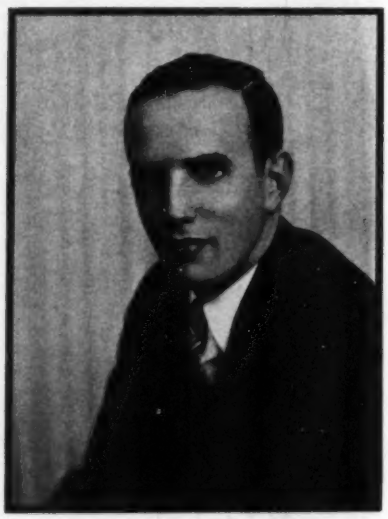
R. W. Cummings, service manager of the Cameron Machine Company, Brooklyn, intends to be on the West coast the latter part of this month calling on paper mills and paper converting plants in an endeavor to give personal attention and service to CAMACHINE customers.

The company believes this procedure

R. W. Cummings

will help each owner and operator of a CAMACHINE winder or rewinder to get the best service out of the machine. Mr. Cummings feels this is best done by a personal call.

▶▶▶ To serve the Southwest and its growing industries, the Morse Chain Company, Ithaca, New York, has opened new branch offices at 1418 Polk Street, Houston, Texas, with *Bob Koch,* formerly assistant sales manager at Ithaca, in charge. Mr. Koch, who had been in the latter post for the



Bob Koch

last five of his thirteen years with Morse Chain, will direct service and sales of the Morse line of power transmission products.

◆

▶▶▶ *Arthur B. C. Drew* has resigned his position as general superintendent of The Pairpoint Corporation, New Bedford, Massachusetts. Mr. Drew has not announced his future plans, and for the time being still resides in New Bedford. He is first vice president of the American Pulp and Paper Mill Superintendents Association.

◆

CHAPIN MADE A "MODERN PIONEER"

In recognition of his achievements in the field of industrial research and invention, William R. Chapin, manager of research for E. C. Atkins and Company, Indianapolis, was presented recently with the distinguished "Modern Pioneer" award. This signal honor was accorded Mr. Chapin for his patents in the field of metal cement, among which are several covering processes which make it possible to cement high speed tool steel to lower grade steels.

The "Modern Pioneer" award made Mr. Chapin is one of a number awarded to outstanding inventors and research men who were chosen from hundreds of nominations by the Na-

APPLETON
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tional Pioneers Awards Committee. A feature article covering this award program appeared in the March, 1940, issue of THE PAPER INDUSTRY AND PAPER WORLD. Mr. Chapin, in addition to his latest award, also holds the highly prized "Albert Sanveur Achievement Medal" awarded by the American Society of Metals.

◆

▶▶▶ *Oliver M. Porter,* secretary of the United States Pulp Producers Association, has returned to his office, having successfully recovered from an operation which took him to the hospital immediately after the annual convention of the Association early in February.

◆

▶▶▶ *H. A. Porter,* one of the best known men in the graphic arts industry and vice president in charge of sales at the Harris-Seybold-Potter Company, celebrated on April 13, his

H. A. Porter

thirty-fourth anniversary with the company. A sales and advertising convention was held at the company's Cleveland offices in conjunction with the celebration.

◆

▶▶▶ Now engaged in development activities on all applications of both ferrous and non-ferrous nickel-containing alloys at the International Nickel Company, Inc., is *F. L. LaQue,* who has been assistant director of technical service on mill products. Mr. LaQue has been associated with International Nickel since 1927. Succeeding Mr. LaQue is *Dr. William A. Mudge,* formerly works metallurgist of the company's rolling mill at Huntington, West Virginia, and who recently joined the company's technical service division.

ST. CLAIR MADE CHIEF SALES ENGR. OF E. C. ATKINS

J. A. St. Clair, since 1901 associated with E. C. Atkins and Company, Indianapolis, has been appointed chief sales engineer of the company's industrial division.

Mr. St. Clair started with the company as shipping clerk and from that

J. A. St. Clair

post handled several supervisory positions in connection with the company's manufacture of various types of saws. For the past several years he has worked in the capacity of engineer and has had charge of the service department. Mr. St. Clair has contributed several important patented products to the saw industry, his latest being the cup wheel radial grinding method of circular saws.

◆

▶▶▶ *James D. Fleming,* formerly vice president and manager of the Grinnell Company of the Pacific, a subsidiary of Grinnell Company, Inc., Providence, Rhode Island, has been appointed vice president and sales manager of the latter organization. He has been associated with Grinnell since 1919 and in his present post will continue to manage the Pacific company but will be located at the company's home office in Providence.

James D. Fleming

Necrology

REV. GEORGE C. STEWART

The Rt. Rev. George Craig Stewart, bishop of the Episcopal diocese of Chicago and widely-known throughout the pulp and paper industry by virtue of his former connection, as chaplain, with the Salesmen's Association of the Paper Industry, passed away in Chicago, May 2.

Bishop Stewart, born of Scottish parentage in Saginaw, Michigan, in 1879, came to Chicago as a boy of fourteen, worked his way through high school and was graduated from Northwestern University in 1902. In the years that followed, Bishop Stewart rose to become one of the most widely-known men of Chicago. At the time of his passing he was rector of St. Luke's church in Evanston.

Keenly interested in industry and business, as well as his church work, Bishop Stewart is well remembered for his several inspirational talks and addresses made at Salesmen's Association meetings. Many paper men will recall his address at the first fall meeting of the Association at which time the bishop spoke on "Constructive Salesmanship." It was in this talk that Bishop Stewart pointed out that "constructive salesmanship must be business that is honest, kindly, helpful and that has time for the eternal values of life." During the World War the bishop served in France as chaplain of evacuation hospital No. 6.

Surviving Bishop Stewart are his widow and two sons, John Clyde and George Craig, Jr., who reside in Evanston.

◆

▶▶▶ Formerly president of the Dominion Paper Box Company, Ltd., Toronto, *Alfred Jephcott* passed away at his home in York Mills on March 30. He is survived by one son and one daughter.

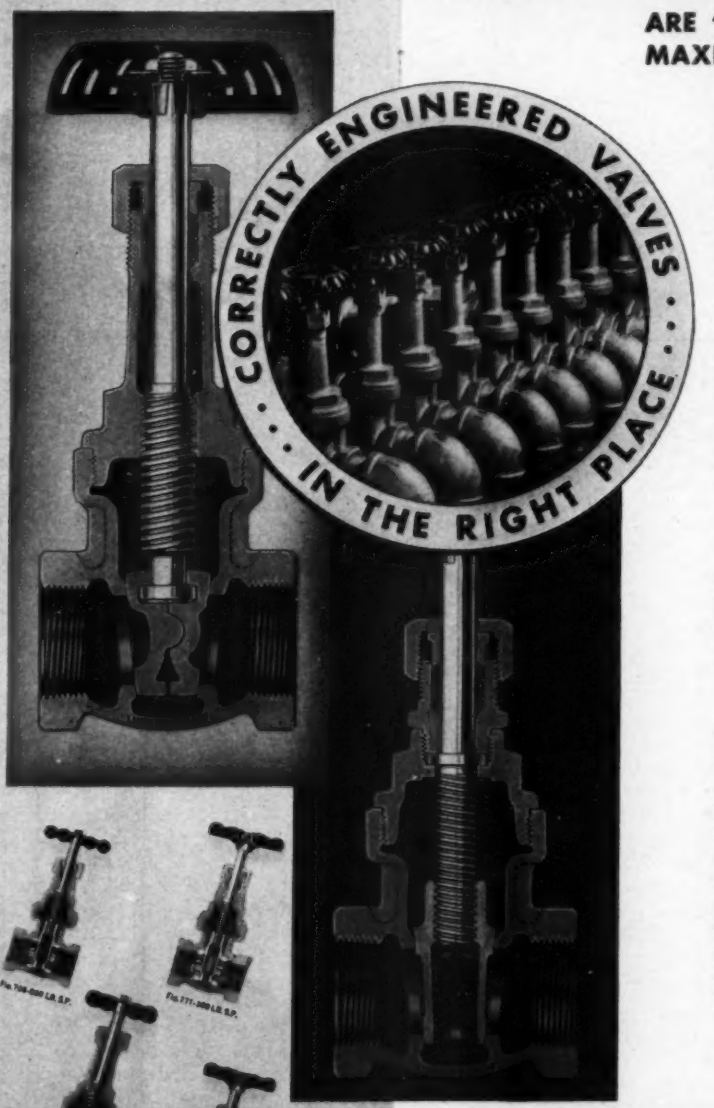
◆

▶▶▶ Head of the MacLaren power and paper interests since the turn of the century, *Albert MacLaren,* 69, passed away recently as a result of an accident. Born in Quebec in 1870, Mr. MacLaren attended Upper Canada College, Toronto, and identified him-

Designed with extra strength where needed, interchangeable parts, plus other features that save servicing time . . . . . .

LUNKENHEIMER *BRONZE GATE VALVES*

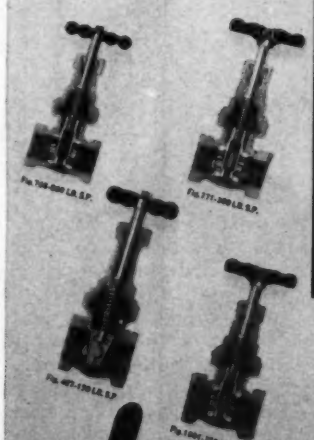
ARE "CORRECTLY ENGINEERED" FOR MAXIMUM ECONOMY ON THE JOB!



From handwheel to pipe threads, there are at least a dozen places to look for convincing evidence that LUNKENHEIMER BRONZE GATE VALVES first, give you more for your valve buying dollar . . . and then save you more on your valve maintenance dollar. Such features as unusually heavy body and bonnet construction, more powerful and accurately machined stem threads, exceptionally sturdy bonnet collar, extra deep stuffing boxes . . . these all combine to guard against failure at points where experience has shown that trouble is most likely to occur. Being an assembled job, with all units produced on a precision basis, any given part can readily be replaced from stock with full assurance of a perfect fit. Even comparatively small details, like beveled disc guides, to facilitate servicing, and the unique stem seat in bonnet, to permit repacking with valve wide open, play a part in the all-over economy of these quality products. You owe it to the profit side of your ledger to investigate the substantially greater value to be found in this line of "correctly engineered" bronze gate valves.

SEEING IS BELIEVING!

Naturally there are basic Lunkenheimer qualities, such as finer materials, continuous metallurgical research, painstaking manufacturing and testing processes, which cannot be seen in the products themselves. We do believe, however, that the purely visible qualities of Lunkenheimer valves will prove conclusively that they are inherently better able to serve you profitably. Won't you, therefore, ask our distributor's salesman, on his next call, to take a Lunkenheimer valve apart and compare it part-for-part with whatever valve you are now using?



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self with the family business interests at an early age. In 1900 he succeeded to the presidency of James MacLaren Company, Ltd. He is survived by three daughters and two sons.

◆

▶▶▶ Formerly vice president of the American Paper and Pulp Association, *Chester W. Alden,* traffic manager of the Oxford Paper Company, Rumford, Maine, passed away April 20 at his home in Portland. He was 53 years of age and at one time was connected with the Russell Company of Boston. He had been a director of the New England Pulp and Paper Traffic Association.

◆

W. H. BACHERT

William H. Bachert, president of the Coshocton Straw Paper Company, Coshocton, Ohio, passed away April 27 at his home. He had been ill for three months.

Born in Canton, Ohio, in 1863, Mr. Bachert came to Coshocton in 1890 and was actively engaged in the straw paper manufacturing industry until the time of his semi-retirement in 1913. He retained his official connection with the company until his death.

◆

▶▶▶ *John H. Taylor,* son of a pioneer papermaker in the Don Valley, Ontario, passed away recently at the age of 87. Mr. Taylor and his brother carried on the business of their father for many years. Mr. Taylor's father was reputably the first man in Canada to take out a patent for making newsprint from wood pulp.

OTHER COUNTRIES

WAR INCREASES THE DEMAND FOR REED

The thatched roofs of Old England have provided an industry for reed gatherers for hundreds of years; now the war has made hundreds of thousands of acres still more valuable for with the shortage of paper these reeds are being pulped.

The reed harvest at Norfolk Broads was almost finished in April and the cutters are hoping for a price of fifty cents a fathom or more and that the Ministry of Agriculture may be persuaded to subsidize the new industry. During times of scarcity the reeds have fetched as much as a dollar a fathom.

With the development of the industry, hundred of acres of derelict reed ground will be cultivated and it is believed that the Norfolk Broads will be able to replace the 300,000 tons of esparto grass which hitherto has been imported every year for the paper industry.

Norfolk will not be the only county to benefit if the demand for reed grows as it is anticipated. Many of the eastern counties, where the ground is lowlying and abounding in fen and marsh, should produce sufficient reeds of similar quality to cover a large proportion of the demand.

◆

THIRTEEN MILLS LOST BY FINLAND

According to press reports and other sources a substantial portion of the former Finnish pulp capacity has been acquired by the Soviet Union. The best information available indicates that about thirteen mills, with an annual capacity of about 392,000 tons of wood pulp were lost by Finland to Russia. According to estimates this represents, roughly, about nineteen per cent of the total Finnish production.

According to a British journal, the area ceded to Russia represents about 6½ per cent of the area of the Finnish Republic as constituted in 1919. The item points out that Russia has also gained partial control of the Saimaa Canal, a waterway which has always carried a large part of the Finnish timber and pulp exports, whose free passage will now depend on Russian good will.

◆

▶▶▶ THE CHINESE MILL, Ta Haw, located at Soochow, China, has resumed operations after a 2½-year shutdown. The mill has registered with the Japanese-sponsored Kiangsu Provincial Government with a capital of 250,000 yuan (yuan equals about $.0683 United States currency).

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▶▶▶ IN ORDER TO PROVIDE IRISH MILLS with paper to replace that formerly imported, the Government of Ireland will control waste paper prices and will also organize waste paper collection. Present prices in Dublin are based on British control prices.

◆

▶▶▶ PLANS TO ERECT A PLANT for the manufacture of insulating board are reported under way in New Zealand. No indication is given as to the approximate time of operation, although it is reported that an initial outlay of $1,120,000 has been made.

◆

▶▶▶ GERMANY NOW USES WASTE PAPER for the manufacture of oil cans, a Department of Commerce release stated recently. In order to insure that these paper bottles for lubricating oils actually fill the requirements of the trade, they have been standardized. The bottles are made of paperboard which, in turn, is produced from the waste paper.

◆

▶▶▶ A NEW MILL is to be erected in Shanghai by the Japanese Federation of Rayon Manufacturers of Tokyo. The mill, which will cost about $2,500,000 will have several large production units which will be completed during 1940.

◆

SYNTHETIC GOODS ARE FEATURED AT LEIPZIG FAIR

One of the interesting trends noted at the conclusion of the Leipzig Trade Fair, which was held in the German city recently, was the progress made in the utilization of basic materials derived synthetically. This progress, a report stated, was particularly noticeable in the textile field—both rayon and synthetic wool being in evidence.

An improved Vistra fiber was demonstrated that showed a tensile strength and curling ability equal to natural wool, it is claimed. Other interesting features were: cans of pressed waste paper and cardboard, veneers of plastic lacquer on a paper background simulating wood grain, fishskin handbags, a clothes line of spun glass and water and acid proof barrels. Novelty effects in rayon, either alone or with mixtures of wool and cotton, appeared in a complete collection of fabrics and dress trimmings and in a great variety of colors.

An attractive set of four stamps has been issued in honor of the Leipzig Trade Fairs. The stamps show various Fair buildings and an air view of the Engineering Fairs. About 115,667 visitors attended the Fair this spring.

The supremacy of Perkins Calender Rolls is the natural result of the broadest experience in the paper industry.

B. F. Perkins & Son, Inc., Holyoke, Mass.

ENGINEERS AND MANUFACTURERS

Convention Papers . . . Abridged

Significance of Bacterial Control in Paper

C. N. BAKER, Consulting Engineer

Any reference to bacteria conveys to the lay mind the idea of disease. Even health officials, who are trained to distinguish between the significance of different types of bacteria, become apprehensive when the bacterial content of a product is mentioned, particularly where it has any association with foods.

Since milk is a most susceptible food to contamination and in view of the present development of paper containers for milk, let us draw a comparison between milk, the food, and paper, the container.

The pulp from which the paper container is made originates from wood. In all chemical pulping processes the wood goes through a process which definitely sterilizes and removes all bacteria. There is a minimum of personal contact in the pulping process. Furthermore, the pulp is usually handled in a dry state or a condition not conducive to the retention of pathogenic types of organisms.

A large number of the papers presented at the annual meeting of the Technical Association held in New York City, February 19-22, 1940, have been digested and regular installments will be published until all are presented. Some of these abridgments have already appeared in the March and April issues.

Even though reused paper is contained in the stock make-up, this paper has usually been maintained in a dry condition so that there has been little opportunity for pathogenic types of organisms to remain in it, even though it might have been contaminated.

Finally the paper or paper stock is mixed with water before it goes to the paper machine. Most mills have water supplies comparable with municipal drinking supplies. The water is either treated in modern purification plants or is secured from ground water sources.

From the wet end of the paper machine the paper sheet passes over a series of drying rolls which are steam heated to a temperature of 230 to 280 deg. Fahr., the usual temperature running about 260 degrees. The time required to pass over the dryers is usually about 3 minutes. The heat produces steam in driving the water from the paper. Compare this treatment with that for pasteurization of milk at 143 deg. and 160 deg., 100 deg. higher temperature for the paper. Furthermore, no personal factor is involved, because unless the temperature is maintained, paper is not made, while if there are defects in the pasteurizing equipment in connection with the milk, the milk may still pass through and go to the consumer.

Pathogenic types of organisms do not survive the dryers on the paper machine. It is necessary, however, that pure water be used on the calendar rolls, or other points at the end of the dryers, to be sure of retaining the germicidal efficiency of the dryers.

We now have the finished product, the milk ready for the market, and the paper board ready for making into the container. The Code of the U. S. Public Health Service limits the bacterial content of paper used in making milk containers or milk bottle caps to 250 per gram. The same specifications, however, permit up to 30,000 bacteria per cubic centimeter in pasteurized Grade A milk.

A paper milk bottle will weigh about 50 grams, thus permitting a total bacterial content in the container of 12,500. The quart of milk, however, may contain 28,380,000 bacteria, 2260 times as many as are permitted in the paper container.

The above analogy, however, is unfair to the paper because it would hold only in case the container were ground up and mixed with the milk, while, in fact, the milk only comes in contact with the surface of the paper which is protected and sterilized with a hot coating of paraffin.

A somewhat similar parallel may be drawn with public water supplies. Many large cities secure their public water supplies from polluted sources. The City of Cincinnati, Ohio, is an example. This water passes through water purification plants consisting of filtration and sterilization usually with chlorine.

The operation of the water purification plant is dependent for efficiency to a considerable extent upon the personal factor. Unless the filters are kept in proper condition and washed efficiently at the proper time, and unless the chlorine apparatus is maintained in perfect operation at all times, water may pass through which carries pathogenic types of organisms. In other words, in water purification, as in the pasteurization of milk, the personal equation is an important factor.

Unless the dryers are operating at practically full temperature paper is not made, so the personal factor in the sterilizing efficiency of dryers on a paper machine is eliminated.

Even though the water is delivered from the purification plant in a sanitary condition it may become contaminated in its distribution, as, for instance, the amoebic dysentery outbreak which developed in certain hotels in Chicago during the time of the World's Fair. In this instance the water system in the hotels was contaminated because of faulty plumbing fixtures. Likewise, milk may be contaminated in distribution, even though sanitary containers are provided.

A report of the Joint Committee of the Public Health Engineering Section of the American Public Health Association and the Conference of State Sanitary Engineers in 1934 contains data regarding the bacterial content of unwashed and washed glass bottles. The maximum bacterial count showed 2,300 billion per quart bottle of 107 bottles examined, the minimum, 25 billion, and an average of 320 billion. The best method of washing left a maximum of 5.6 million, a minimum of 40,000 and an average of 1.6 million. The washing, however, did not include the chlorine rinse.

Investigate the possibilities of the

BRASSERT *Automatic* STRAINER

in Your Mill:

In many exacting services, Brassert Automatic Strainers are showing notable efficiency in the continuous and automatic removal of suspended solids from liquids.

Pulp and Paper Mills employ the Brassert Strainer for primary water filtration, as well as for recovery and filtration operations where the percentage of foreign matter in the fluids treated is high and the volume very large.

These Advantages of the Brassert Strainer May Mean Lower Costs for You

The Brassert Strainer is self-contained, on one base. • It requires minimum space — cost of installation is low. Screening media consists of glazed porcelain or stainless steel discs—non-corrosive and easily backwashed.

The Brassert Strainer requires but little power, practically no attention. It is adapted to fibrous and granular material—non-clogging. • It is built in sizes from 2" to 30" line connections; may be installed in or out of doors.

●**Bulletin PI** *contains complete engineering data and performance characteristics. For a free copy, drop a card to*

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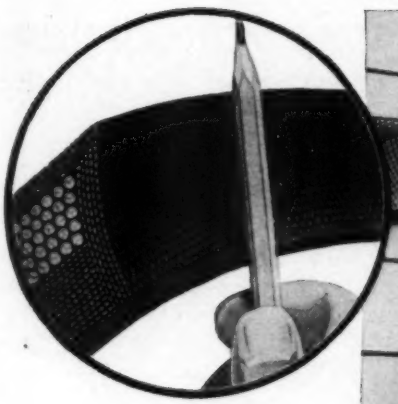

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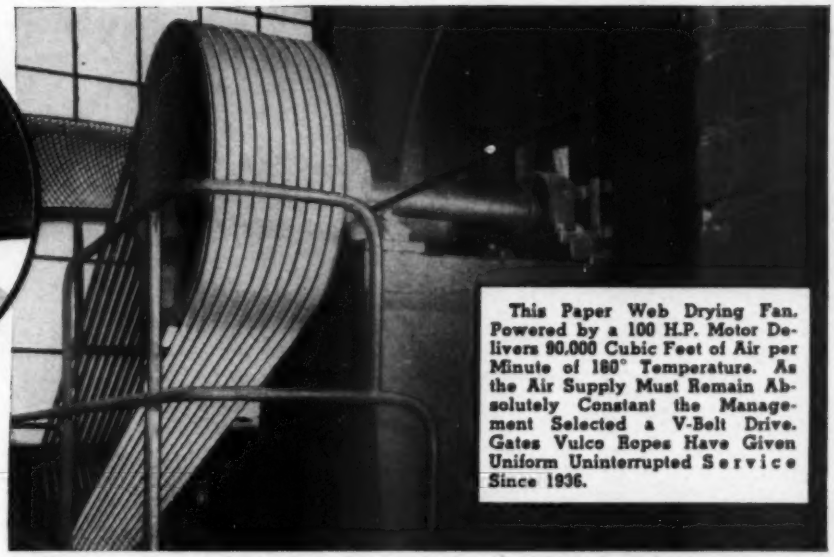

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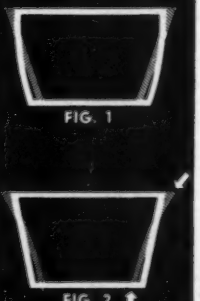
What Happens When a V-Belt Bends



As a V-belt bends, you can actually feel its sides change shape! The top of the belt is under tension and grows narrower (see figure 1, at left). The bottom is under pressure—therefore it widens. These stresses force a straight-sided V-belt to bulge in the sheave groove (Fig. 1), and this produces uneven wear on the belt sides, resulting in *shorter life!*

Now look at figure 2. There you see how the concave side of the Gates Vulco Rope (U. S. Patent 1,400,539) exactly corrects this bulging. It insures a perfect fit in the sheave groove with uniform side-wall wear and, therefore, longer life! It insures that the entire side-wall grips the pulley—heavier loads are carried without slippage—belts are saved and power consumption reduced.

V-Belt in Sheave

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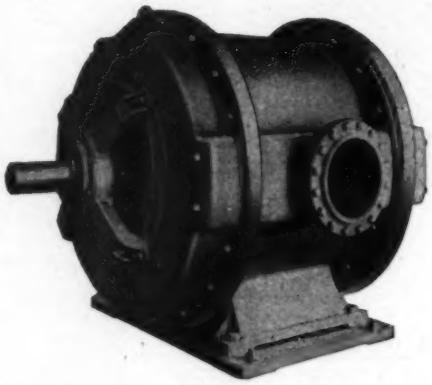

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Layson, Huffer, and Brannon conducted tests with 454 bottles from plants in different sections of the country with more efficient washing. They state:

"The unevenness in the bacterial count of bottles was very noticeable. In any case of 12 bottles there might be two or three sterile ones, while some of the others might contain as many as 180,000 to 200,000 bacteria per bottle. In three plants bottles were found which were uniformly low, the count being below 1,000 bacteria per bottle. In the rest of the plants, some of the bottles contained less than 1,000 bacteria per bottle, while others contained hundreds of thousands, and the rest of the counts were between these extremes."

Similar tests with paper containers have shown nearly 90 per cent with no bacterial count and an average of only 2 or 3 per container for the remainder.

Total bacterial count of paper used for food containers is without significance from the public health standpoint. Mere numbers of bacteria have no health significance.

Wherein then lies the significance of bacterial control in paper and paper board?

Under parallel conditions the total count may furnish somewhat of an index regarding cleanliness or housekeeping in the mill. It may also be used as an index in connection with slime control. This, however, is no new development.

Notwithstanding the fact that standards of the U. S. Public Health Service require a maximum count of 250 bacteria per gram in paper board used for milk containers and milk bottle caps, this standard is not coupled with any standard method or technique in analyses. The adoption of standard procedure and technique is imperative if comparable results are to be secured. TAPPI could render an excellent service in developing such.

The Flocculation and Dispersion of Papermaking Fibers[1]

AUGUST ERSPAMER, Chemist
P. H. Glatfelter Company

The importance of formation in determining sheet properties cannot be overemphasized.

Maximum fiber dispersion in the headbox of the paper machine and maintenance of this condition until the sheet is completely formed are desired in order to obtain optimum sheet formation. Proper design of headbox, slice, and inlet, based on practical experience and fundamental hydrodynamic principles, has been a step in this direction. In some cases, however, it has not been possible to obtain the desired formation because of fiber flocculation effects which take place after the stock has passed the slice.

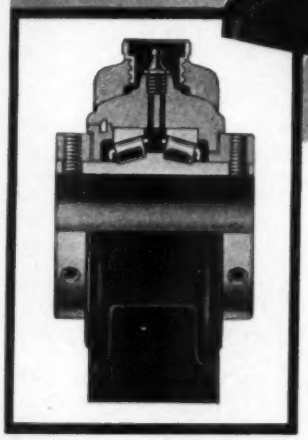
In the case of white water recovery, on the other hand, maximum flocculation is desired in order to obtain the greatest efficiency. Further, flocculation undoubtedly plays an important role in increasing the retention of fiber and filler on the paper machine itself.

In his preliminary investigation, Wollwage developed equipment and techniques which permitted a study of the flocculation of papermaking fibers in flowing suspension. Alumina floc, low white water temperatures, deacetylated karaya gum, and low fiber consistencies were found to decrease fiber flocculation markedly. Several factors, such as the presence of hydrophilic bentonite clay and wetting agents in the pulp and the degree of beating, increased the flocculation characteristics slightly but an increase in fiber length did not have a marked effect.

The purpose of the present investigation was to make a more extended study of the factors involved in fiber flocculation so as to establish more definitely their relative effects. In conjunction with the use of the flocculation tester, the technique involving the formation of handsheets under standardized conditions with the subsequent determination of formation has helped in determining the importance of the nonmechanical factors involved in sheet formation.

Finally, an investigation of the electrokinetic phenomena at cellulose inter-faces (fiber charge) seemed to offer a means to a clearer understanding of the fundamental causes of fiber flocculation. The marked effects brought about by nonmechanical factors, such as are involved in the use of alum, Sveen glue, and deacetylated karaya gum, indicated that there was the possibility of existence of fiber to fiber adhesion forces

(1) A portion of a thesis presented in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Doctor of Philosophy from Lawrence College, Appleton, Wis., June, 1939.



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which are electrical in their ultimate nature.

The flocculation tester developed by Wollwage [*Paper Trade J.* 108, no. 12:41-48; no. 13:25-34 (March 23, 30, 1939)] was used for the preliminary work in this investigation.

In the handsheet study, which involved the making of handsheets under standardized conditions with the subsequent determination of the formation, the Noble and Wood sheetmaking machine described by Coghill [*Paper Trade J.* 102, no. 9:27-44 (Feb. 27, 1936)] was used. Pulp at 2.5 per cent consistency, which had been stirred for 7500 revolutions in the standard British disintegrator, was diluted to 1 per cent consistency, and stirred for 5 minutes with a small Lightnin' mixer.. A volume of 500 cc. of this suspension was taken and the stirring continued for two minutes before adding the stock to the headbox. When used, chemicals were added at this point.

The Thwing formation tester (photoelectric) developed by Davis, Roehr, and Malmstrom [*Paper Trade J.* 101, no. 4:31-36 (July 25, 1935)] was used to measure the formation of handsheets.

The standard pulp employed was an unbleached, quick-cook, Canadian spruce sulphite. The chemicals used were C.P. alum [$Al_2(SO_4)_3.18H_2O$], C. P. anhydrous aluminum chloride ($AlCl_3$), C. P. tetrasodium pyrophosphate ($Na_4P_2O_7.10H_2O$), commercial Sveen glue, Turkey red oil, Du Pont Product BC, Onyxsan *S*, and Duponol WA. Tapioca starch was cooked by heating to 90 deg. C. and locust bean gum dispersion was prepared in the same way.

The results of the Sveen glue studies may be summarized as follows:

Alum or aluminum chloride must first be added to the pulp suspension in order to obtain the Sveen glue flocculating effect. No effect is observed when Sveen glue alone is added to the pulp suspension or when the alum is added after the Sveen glue. Alumina floc or some other positively charged precipitate seems to be necessary, for when the pH is lowered so that no floc forms a dispersing rather than a flocculating effect is observed. When a strongly negatively charged precipitate, such as that formed by tetrasodium pyrophosphate, is present, the Sveen glue effect is inhibited.

The results of both the flocculation tester and the handsheet studies lead to the conclusion that the Sveen glue effect most likely depends upon the adsorption of the negatively charged glue by the positively charged alumina floc to bring about an isoelectric condition on the fibers. The effect of adding alum to the isoelectric fibers is to increase their charge and thus enhance dispersion.

The addition of increasing amounts of alum to handsheets in the range of 0 to 45 per cent (based on the weight of fiber present) first gave rise to a greater degree of flocculation, whereas the higher percentages caused dispersion.

Tetrasodium pyrophosphate effected dispersion, without an initial flocculation, when added to a tap water suspension of pulp, and the dispersing action was as great as that with alum. However, no effect was observed when the tetrasodium pyrophosphate was mixed with a pulp suspension in distilled water, and dispersion was brought about only by the addition of calcium chloride which formed a precipitate with the pyrophosphate.

A study carried out with the flocculation tester showed that the flocculation characteristics of pulp were practically the same for the pH range 4.0—7.2. It can be safely said that pH variations in the paper range have a negligible effect on flocculation.

Handsheet studies were carried out using a neutral rosin size. The alum content was constant at 5 per cent, and the pH was maintained at 5.2 by the addition of sulphuric acid to the headbox. The results show that rosin size has an appreciable dispersing effect.

Clay (a hydrous filler) was found to flocculate pulp in the absence of alum, but calcium carbonate (a nonhydrous filler) had no effect.

Starch flocculated the pulp fibers, even showing the effect in the absence of alum. Starch was found to be about as effective as Sveen glue in clearing up white water in which clay and fiber were present, although greater percentages of starch were required.

Negatively charged wetting agents (Duponol WA and Turkey red oil) in the presence of alum and air, flocculated pulp fibers and caused them to float out of suspension, but positively charged wetting agents (Du Pont Product BC and Onyxsan *S*) had no such effect. The addition of positively charged wetting agents to pulp suspensions which had been dispersed with alum enhanced the dispersion, while the

(*Continued on page* 176)

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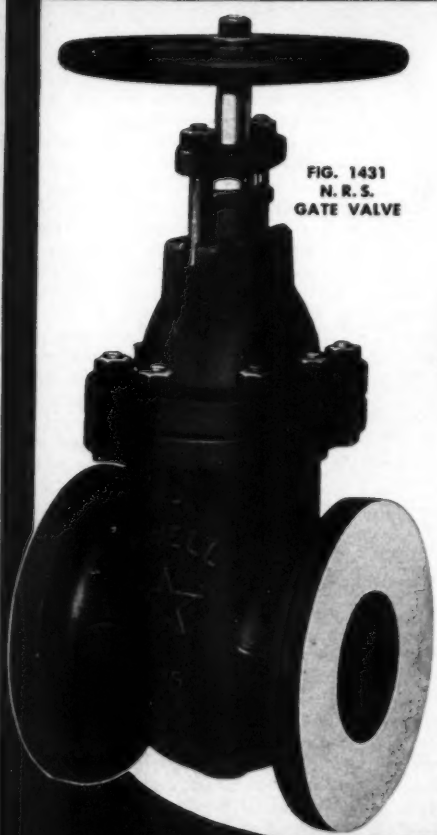

FIG. 1431
N. R. S.
GATE VALVE

FIG. 241
O. S. Y.
GLOBE VALVE

FIG. 1444
O. S. Y.
GATE VALVE

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(*Continued from page* 172)

negatively charged wetting agents caused flocculation.

The effect of adding increasing amounts of Onyxsan *S* to a pulp was to cause marked flocculation at first, but larger amounts brought about dispersion.

Locust bean gum, a hydrophilic colloidal substance, was found to be a very powerful dispersing agent, much more effective than deacetylated karaya gum. Its effect was evident even at low pH values and in the presence of 5 per cent alum, and, unlike deacetylated karaya gum, was not affected by agitation. The results of electrophoretic studies support the theory that hydration film is the controlling factor in the dispersion of pulp by locust bean gum.

Methylcellulose was found to have as strong a dispersing action as locust bean gum, and it is believed that, in this case also, dispersion is due to hydration film.

A comparison of the effects of the various deflocculating agents reveals that a concentration of between 0.1 and 0.5 per cent locust bean gum is as effective in dispersing pulp as a decrease in temperature from 25 deg. to 8 deg. C., as 1 percent deacetylated karaya gum, as 25 per cent alum, or as 5 per cent Onyxsan *S*..

Martin and Gortner [*J. Phy. Chem.* 34:1509-1539 (1930)] found that the electrokinetic potential of cellulose in benzene was zero, whereas the value was —.142 mv. in nitrobenzene. This value is quite large when compared with —5.8 mv. for the cellulose-water interface, and —19.9 mv. for the ethyl alcohol-cellulose interface.

On the basis of these facts, experiments were carried out to determine whether the flocculation behavior of pulp in these various liquids was connected in any way to the known eletrokinetic potential values.

The results prove that in the case of pulp with zero electrokinetic potential and no hydration film (the pulp in benzene) there is no stabilizing influence, and extreme flocculation takes place. The pulp fibers in nitrobenzene have no hydration film, but the fact that dispersion takes place demonstrates that the charge on the fiber can maintain the pulp in a dispersed condition provided it is suffiiently high.

Laboratory Evaluation of Paper Coating Raw Materials

C. G. LANDES
Stamford Research Laboratories
American Cyanamid Company

As there are few complete descriptions of coating material evaluation methods available in the literature, it is proposed to cover in some detail an integrated procedure representative of good commercial practice. Much of the material for this paper is not original, but is based on developments made in laboratories throughout the country.

Below is given a complete list of the equipment and materials used:

1) Pigment dispersion set-up, with suitable containers and stirrers.

2) Water bath, with temperature control, for cooking adhesives.

3) Thermometers, enclosed paper scale floating type, range about 0 deg.—220 deg. Fahr.

4) Test Sieve, U. S. Bur. Stds. No. 100 (100 mesh), brass gauze, about 8 in. diameter.

5) Viscosimeter, rotating cup or pipette type.

6) Laboratory sheet coater.

7) Hot air dryer, with thermostat. Preferably with forced air circulation.

8) Torsion balance, 1-30 grams capacity, accurate to 0.01 gram.

9) Constant temperature and humidity room (desirable but not absolutely necessary).

10) Sheet supercalender.

11) Gloss tester.

12) Opacity tester.

13) Color or reflectance measuring instrument.

14) Smoothness tester.

15) Test ink for comparing receptivity.

16) Test waxes.

17) Microscope or magnifier.

18) Standard rawstock, pigments, adhesives, and miscellaneous chemicals.

The general procedure for dispersing the pigments is as follows: The measured quantity of distilled water is placed in beaker or mixer, dispersing agents added if desired, and the stirrer inserted and started. The weighed pigments (allowance made for moisture) are dropped into the water and stirred for a period of two hours, during which time the adhesive is prepared. Occasionally the stirrer is stopped momentarily and the pigment scraped from the blades and sides of the vessel with a stainless steel spatula.

Exact details of the most desirable procedure have to be worked out to suit the requirements of each individual laboratory.

Important factors in obtaining proper pigment dispersion are to adjust the solids content, working volume, and stirrer type or speed to the optimum points. It is very essential that the pigment mix be quick enough to offer a reasonable amount of resistance to the rotation of the stirrer blades. On the other hand, the mix must not be so thick that flow and circulation of the mixture is impeded. Speed of the blades may have to be varied occasionally, although 100-110 r..p.m. for the vertical stirrer is satisfactory in most cases.

Of course, dispersing equipment such as ball mills, planetary mixers, and other types may be used if desired. The check on adequate pigment dispersion is in the grit test made on the finished coating color. A color which contains over 0.1 per cent or 0.2 per cent dry grit (based on the total dry solids weight) retained on a 100 mesh screen has not been dispersed properly, or possibly contains pigments of inferior quality which cannot be dispersed satisfactorily under any conditions.

The following procedure covers the preparation of casein adhesives only.

Casein usually is cooked with a water-to-casein ratio of 5 to 1, although occasionally a lower proportion of water may be necessary. The ratio given refers to weight of water to dry casein, and includes water required to dissolve the alkalies.

A tare weight is taken on a glass beaker and thermometer, and the measured quantity of distilled water at room temperature added. The weighed casein (allowance made for moisture content) is added and soaked for 15 minutes. The mixture is stirred occasionally during the soaking period.

Meanwhile, the alkalies, if solids, are dissolved in water and added to the casein while stirring continuously with the thermometer. The mixture is placed immediately in the water bath (which is maintained at about 150 deg. Fahr.) and brought up to 140 deg. Fahr, as quickly as possible. Stirring must be almost continuous while coming up to temperature, but need be only occasional thereafter. A watch glass is then placed over the beaker to reduce scum formation.

After one hour of cooking at 140 deg. Fahr. the casein "solution" is taken from the bath and cooled in the air or a cool water bath. Near the end of the cooling period the beaker, thermometer, and contents are weighed and enough warm water added to make up for evaporation. With the casein solution at from 100 deg.—110 deg. Fahr., and when the pigment has been dispersed exactly two hours, the desired weight (by difference) of solution is poured quickly into the pigment mixture. About 25 per cent excess casein is cooked so that the desired amount can be weighed easily by difference.

After the casein is added the coating color mixture is stirred 30 minutes, stopping the stirrer two or three times to make certain that the blades and beaker sides are perfectly free from lumps of material. At the end of the 30 minutes, special chemicals, such as preservatives, defoamers, dyes, eveners, etc., are added and the mixture stirred for 30 minutes longer.

The color is then screened through a 100-mesh test sieve, and the screened color returned to the agitator until used. The grit on the screen is washed for 2 minutes with a stream of distilled water running at a rate of 1000 cc. per minute, and the grit dried to constant weight at 100-105 deg. C. in a weighing bottle. Samples of the screened color are weighed, and dried to constant weight at 100-105 deg. C. to obtain the dry solids content. The color solids test serves as a check on the accuracy of measurement of the various raw materials used in making the batch.

A viscosity test on the color after screening gives valuable information relating to the working qualities of the mixture in question. For any particular laboratory coating machine a range of viscosities is found by experience which gives best spreading results. As the color usually is made a little on the heavy side, it is customary to thin down the mix with water to a suitable viscosity, before coating.

Better spreads are obtained and pinholes eliminated by addition of an evener to the color at some convenient time such as suggested above. The proper amount and type of evener must be determined by trial. One per cent of soluble fine oil (a commercial oil of about 60 per cent solids containing pine oil and sulphonated castor oil) on the weight of dry pigment present has been found to give very good results.

Details of color application vary according to the equipment used. The following brief description applies only to the Martinson Laboratory Sheet Coater. The rawstock is cut into sheets 9.5 in. x 10.5 in., and the sheets are weighed to the nearest 0.01 g. on the torsion balance. The basis

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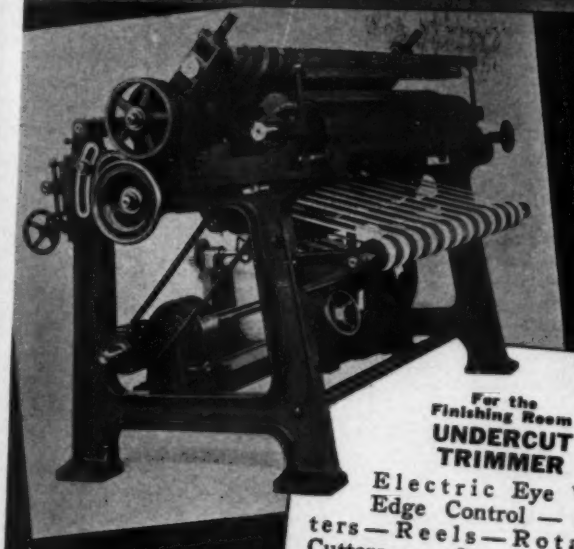

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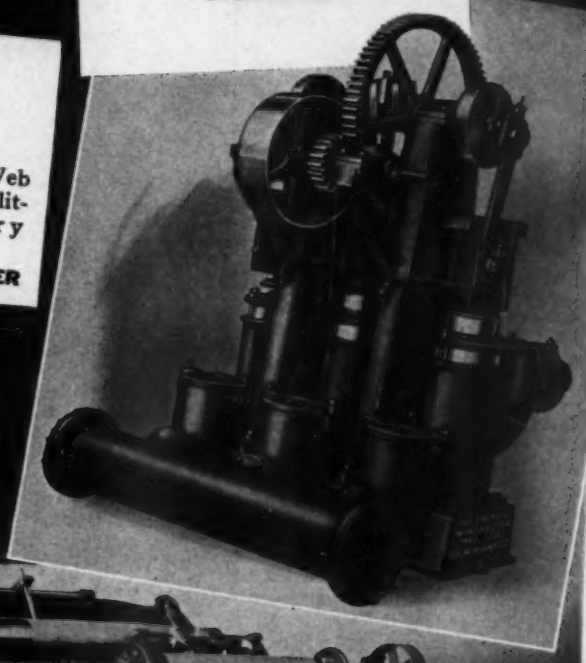

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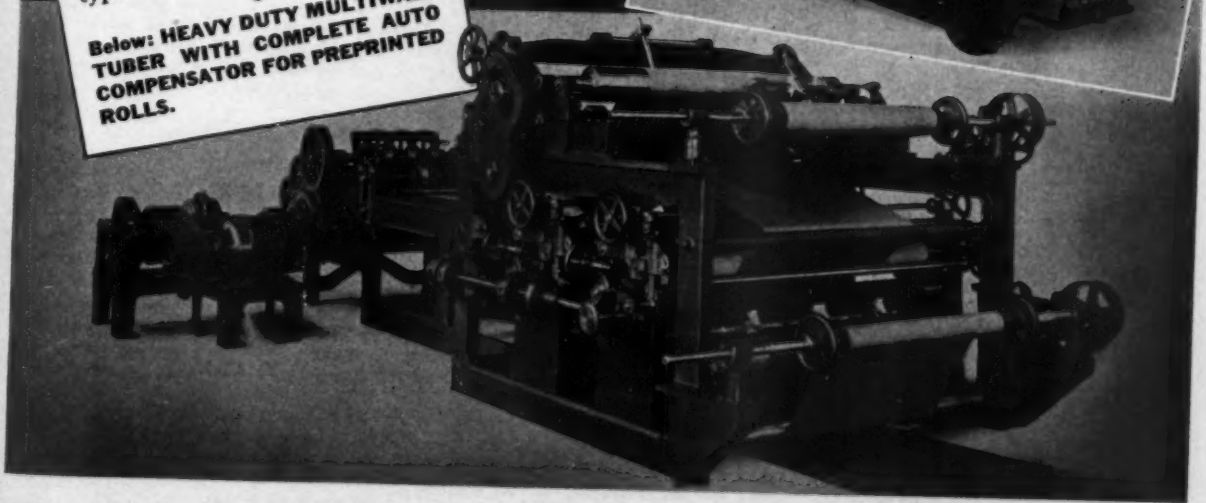

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weight is found from a table, and the weight and batch number are marked on the back of each sheet.

The sheet is coated by fastening it in place on the apparatus, felt side up, pouring on a strip of coating color across the edge of the sheet nearest the coater blade, and immediately pulling the sheet under the blade with a smooth easy motion. The speed best suited for a good spread must be learned by practice. It is essential to obtain an even spread. Results should be judged by both general inspection, and by cutting the sheet into sections and weighing for uniformity of coat weight.

Drying procedure may be varied to fit local conditions. A convenient method is to allow the sheet to air dry for 4 minutes, then place it in a forced draft oven at 220 deg. Fahr. for 4 minutes. Interval timers are convenient for keeping close watch of the drying time.

In adjusting the coat weight, two procedures may be followed: The coated sheets may be held in front of a fan, after taking from the oven, until the weight stops gaining (usually about 5-10 minutes). The basis weight of the coated sheet is taken by means of the torsion balance, and the coat weight obtained by subtracting the rawstock weight. Another procedure is to select about three of the rawstock sheets, dry and obtain the average bone-dry basis weight. The first trial coated sheets are dried bone-dry and the dry coat weight obtained by difference. There is very little difference between the bone dry and air dry coat weights, and either method may be used in setting the coater before running the sheets to be tested.

The coat weight is adjusted to the desired value (15 lb. basis 25 x 38-500 is convenient) and a sufficient number of sheets coated for the required tests. Five sheets are used for the physical tests, and several additional sheets are made for visual observation, filing, and to take care of spoilage. The batch of coated and dried sheets is conditioned overnight at 65 per cent R.H. and 70 deg. Fahr., and the coat weight determined before calendering. Of course, on the actual test sheets the bone-dry method is not used.

The sheet calender is adjusted approximately to a standard pressure by using appropriate commercial samples of uncalendered and calendered paper of an identical lot. The uncalendered commercial sheet is run through the sheet calender, and the pressure adjusted until the finish of the paper is equal to that obtained commercially on the same grade. The experimental sheets then are run through the stack without changing the pressure or other conditions, and examined and tested as described below.

Of the calendered sheets about 8 to 10 of satisfactory spread and coat weight are selected from each trial batch. Five of the sheets are tested both with and cross grain for gloss, before the sheets are placed in the conditioned test room. The five sheets are then conditioned and tested for color or reflectance, opacity, smoothness, ink receptivity, wax pick, and sometimes varnish resistance. A minimum of ten determinations is made for the optical and smoothness tests, and five determinations for the other tests. The remainder of the sheets are examined by eye and with the microscope, and if desired can be tested by running proofs on a test press. Actual details of the test procedures may be obtained from the references, and instrument manufacturers' instructions.

The advantages of laboratory evaluation methods such as those described are self-evident, and have been recognized and utilized by many leading paper coating laboratories. It is possible to predict with a fair degree of accuracy the performance of coating pigments and adhesives, and to develop suitable formulations based upon the performance data obtained. Of course, these data must be correlated with actual mill experience until such time as peculiarities of operating conditions in each mill are recognized and proper allowances made.

It is agreed that the laboratory evaluation methods in use today have certain limitations and shortcomings. The fields in which improvements are most needed are as follows:

1) The Laboratory Coater
2) Pick Test for Surface Strength
3) Ink Receptivity Test
4) Physical Properties of the Coating Mix as Related to Spreading and Brushing Characteristics.

The paper coating industry has broadened out tremendously during the past few years, both as to mechanical methods of applying the coat, and with respect to the constituents of the coating mixture. These changes are making it more important than ever to have available accurate, quantitative methods of evaluating coating materials. It is hoped that paper technologists, in cooperation with the laboratories of raw material and chemical suppliers, will continue to develop improved methods of testing and evaluation.

The author wishes to acknowledge the assistance of Messrs. H. M. Annis, N. I. Bearse, and W. A. Kirkpatrick II, who made valuable suggestions concerning the methods described.

PULP BLEACHING COMPANY

■

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CELLULOSE PURIFICATION

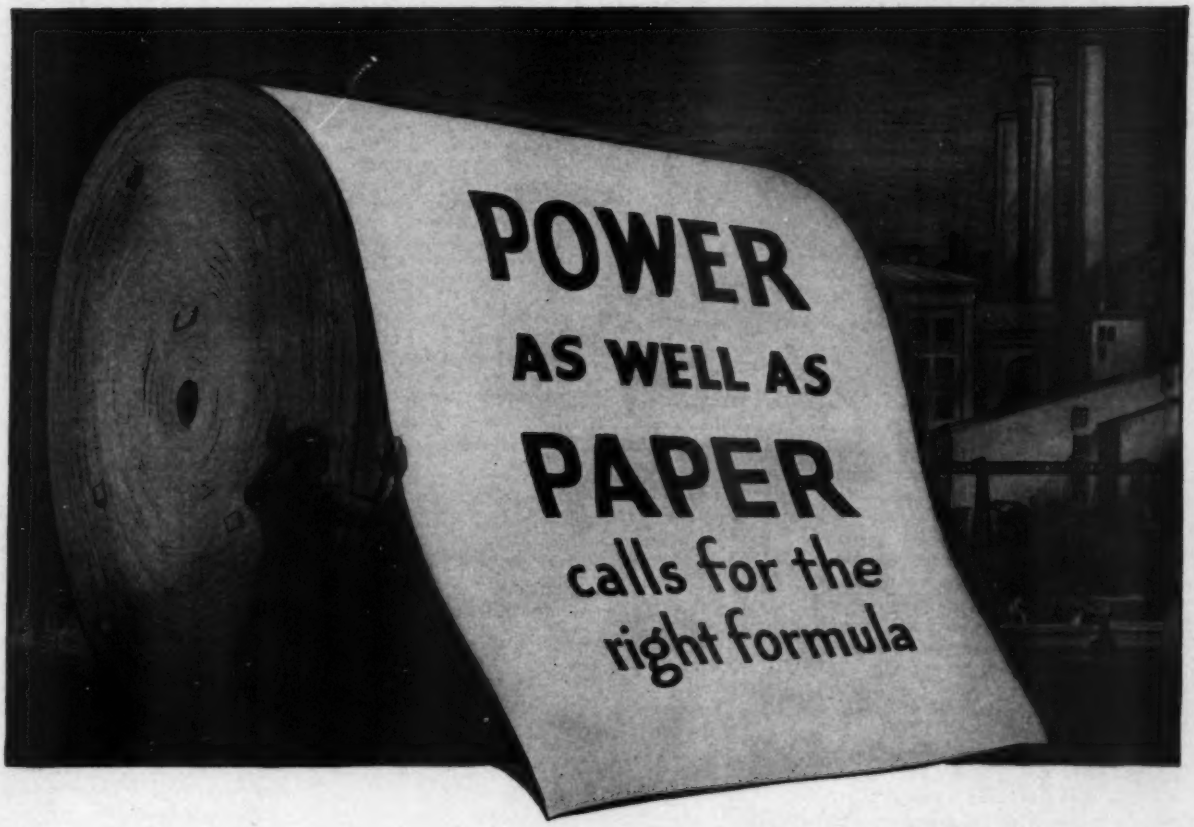
The Stream Flow Vat System

PHILIP H. GOLDSMITH
Sales and Development Engineer
The Pusey and Jones Corporation

On any given cylinder machine there are only two main factors of formation under the control of the machine tender. The amount of mold-head is one of these factors; the other is the relation between mold speed and stock flow around the forming length. The degree to which these factors can be controlled in actual operation limits the quality of the formation, the range of stock freenesses which can be formed, and the changes in "crossing," etc. which can be produced at will.

Since early days, two types of vats have been in most general use. The "overflow" or "direct flow" type flows the stock in the same direction as the mold travel, and has a stock overflow on the upturning side. The "counterflow" vat feeds the stock counter to the direction of mold travel and needs no stock overflow.

Many variations have been tried, for ex-



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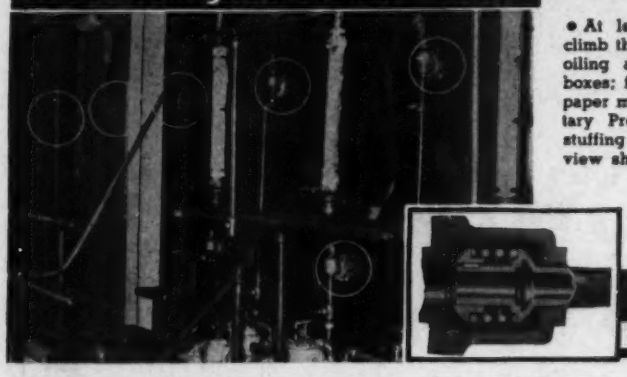

• At least no one will need to climb them for inspecting, packing, oiling and adjusting the stuffing boxes; for this is one of the many paper machines where Johnson Rotary Pressure Joints have ended stuffing box troubles. The sectional view shows the basic construction of these Johnson Joints. Two special, self-lubricating carbon graphite rings form the bearings and pressure seal. Sealed by the pressure, they are self-adjusting. Equally important is the ball and socket design and the annular space around the outlet which provides for angular or lateral misalignment —greatly increasing joint life.

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ample, counterflow vats with stock overflow have been employed to form a very "grainy" heavy weight sheet at slow speed, such as heavy roofing felt. For building up cross strength, "cross-current" vats feeding axially to the mold were resorted to. Each type had its inception in an attempt to make the velocity conditions during formation as suitable as possible for one particular product.

When a machine must be slowed down to obtain good formation, or when the stock must be made slower, just to form properly (possibly with a "sweetening" of furnish to keep up to specifications for "folding," etc.) we know that we are up against forming limitations.

When more mold-head is needed to avoid making the stock slower a number of obstacles can prevent you from getting it.

The counter-flow type of vat presents no opportunity whatever to vary the vat circle flow to suit the stock and speed. The faster the speed, the greater the relative movement of the mold with respect to the incoming stock. The result is a more and more "open" and disturbed formation and a constant increase in "grain."

The older direct-flow vats reduce the relative motion between mold and flow but do not permit the flow speed to be varied as much as the machine speed. Consequently heavy weight sheets are often much more "crossed" than desired and thin or free liner plies of heavy weights tend to "wash." Nor do such vats with fixed circles permit ideal relative clearances at front bottom and back of the vat circle.

The goal of cylinder machine design today is to permit superior formation over a wider range of stock freenesses and ply thicknesses at higher speeds than heretofore and to permit control of fiber crossing to a greater degree.

We may set up the following essential requirements of a modern vat system:

1) All components of flow must be intimately mixed.
2) Air must not be entrained.
3) The vat feed must be steady.
4) The flow must be spread across the machine with exact evenness.
5) The widest possible range of "Mold-Head" should be available independently of circle velocities.
6) The whole range of circle flow velocities needed for all grades and machine speeds should be available and it should be possible to adjust the circle velocity at front bottom and back independently.

The developments taking place today will not surprise anyone who has followed recent trends in this field closely. The Stream-Flow Vat System is merely one which is designed to accomplish in the simplest and most complete manner the results above set forth.

The Stream Flow Vat has an outer fixed circle which prevents leakage and an inner adjustable forming circle which permits establishing ideal flow conditions all around the mold for widely different grades.

The inner circle is a flexible one without hinges and takes on the smooth mathematical curve of flexure for all settings. It is composed of non-corrosive metal and heavy enough to be damage proof. It is supported at only two points, allowing maximum flexing length. The bottom circle distance is varied by raising or lowering the back. The front, bottom and back circle distances can be set independently of each other.

The whole cross sectional area of the molds is open into the vat ends. All flow passages are large. The white water is drawn from the middle of an ample cross pipe connecting the end chambers. The spill gates are operated jointly and can be lowered to the very bottom of the mold. Quick opening wash out doors give easy access to both circles at once.

If changes in stock, product, or speed are desired, new settings are as easily made in a few seconds while running.

One of the most neglected aspects of good formation has been the proper spreading of the flow across the machine.

It is possible to spread a flow with exact evenness if the angle of spread is made gradual enough, especially if the cross sectional area is progressively reduced as the width is increased. This has been done in the past on single cylinder machines where there was ample room for an extended spreading length and has in each case been eminently successful.

The "Flow-Spreader" provides the same results for any machine in a more simple and compact manner. It consists of a series of passes which widen out across the machine and whose area is reduced at the same time. In effect it is a long, smooth nozzle which is doubled back on itself to make it very compact and to allow the cover to

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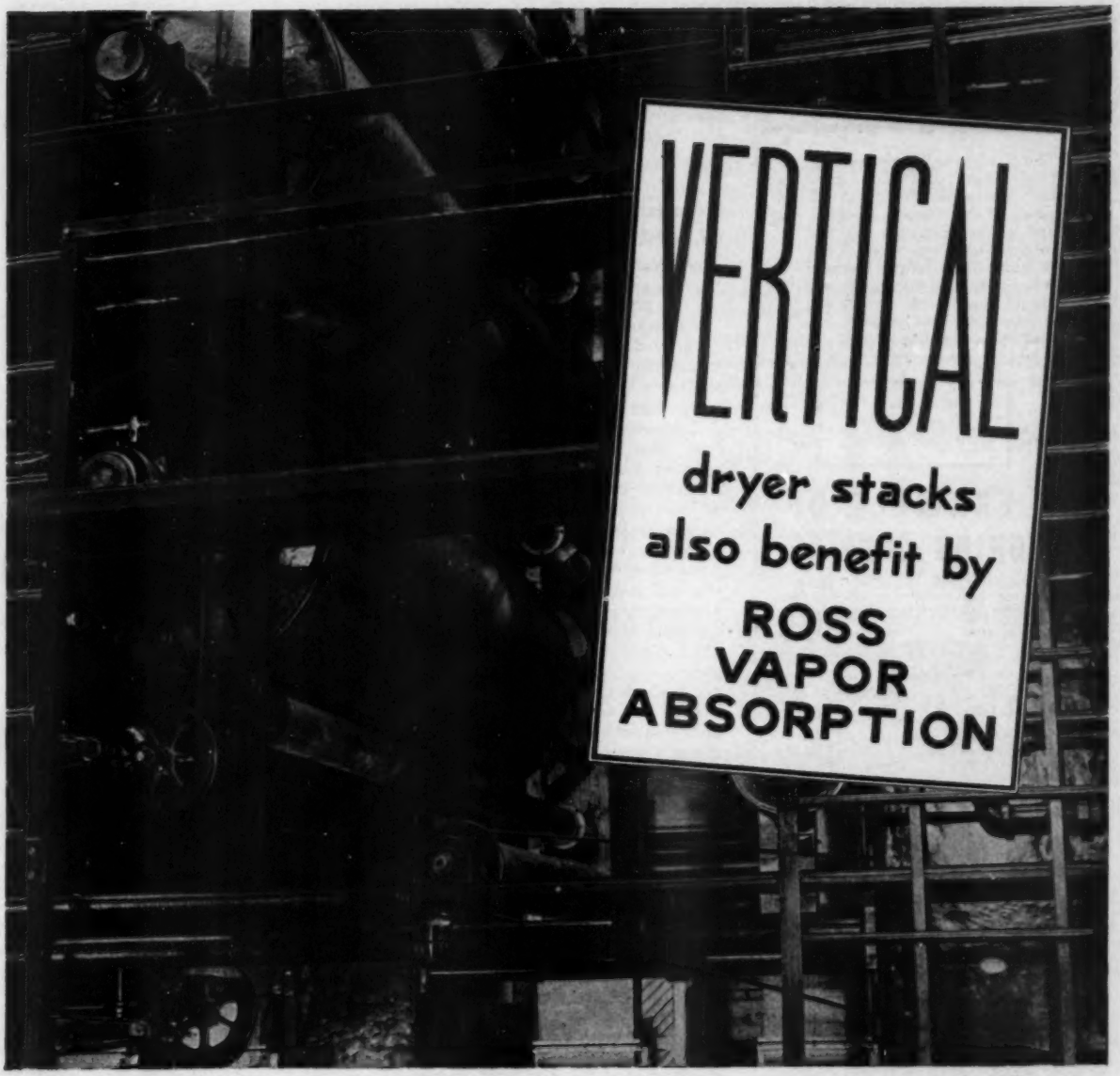

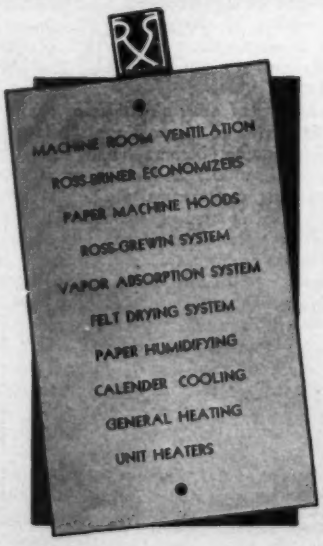

The Ross Vapor Absorption System for clearing dryer pockets of vapor has for years been practically standard equipment for pulp and board drying machines. The known advantages of this system are multiplied as the number of dryer tiers are multiplied. Contrary to a common impression, results show that the vertical stacked machines secure the same major advantages as do other types from this tried and proven method of increasing capacity and uniformity of drying. Write for our bulletin describing this system and its operation.

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From March 1940 Pacific Pulp & Paper Industry

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be thrown back for easy wash-up. Quick opening wash out gates are provided at the bottom and an air vent connects to a quick-break fitting on the cover. There are no obstructions in the flow passages. The "Flow-Spreader" is usually placed in the basement or pit under the vat and thus takes up no additional machine length.

The Up-Flow Head Box consists of an inner and an outer cone which are combined into the simplest form of a two-pass head-box. In contrast to older types of head boxes it has a maximum length of dam for quiet flow and its entire surface is effective for steady feed of the vat.

The total combined and mixed flow moves upward in the inner cone, the velocity being progressively reduced. The downward flow starts slowly and increases progressively until the area of the underfeed pipe is reached. There are no dead corners whatever and wash-up is easy.

The new stock from the screens, the white water and the circulating stock must all be combined before the flow is spread across the vat inlet. The dispersion must be uniform to produce uniform formation.

The "Flow-Mixer" does its work submerged without the presence of an air surface. The cross sectional areas are reduced at the junction to force intimate mixing. Where conditions permit it, the screened stock is in addition fed to the suction side of the circulating pump.

Naturally pumps and piping must be ample for the most extreme sheets to be made.

Controls for pump motors and all valve handles should be placed on the operating floor. Each vat system of a multi-cylinder installation is a complete forming machine. The operator must run all of them jointly. If the machine tender is saved unnecessary steps he will save you money in less broke and shorter change time from one order to the next.

Product-Planning in the Glazed and Fancy Paper Industry[1]

GERALD B. TALLMAN and ROSS M. CUNNINGHAM
Massachusetts Institute of Technology

The product-planning job—what products to produce, how to price them, how much and when to produce, requires the bringing to bear of skill and knowledge from all important divisions of a business—from designing, from production, from financing and from selling.

Product-planning decisions are made consciously or otherwise at all stages of a company's history. A new enterprise makes a very fundamental product-planning decision when it selects a given type of business and invests in plant and equipment. Then it must decide what products and variations within product lines it should make. Later there come problems of redesign, of dropping products, of adding new products and sometimes of abandoning a dying industry and striking out into entirely new fields. Then, of course, there are always the day-to-day or season-to-season decisions of what specific designs, prices, sizes, and quantities of product shall be offered.

Every company must be vigilant to examine its own situation to see what differential advantages it possesses over competitors in the same field, as well as the advantages which the entire industry has over other industries whose products either satisfy the same needs or compete aggressively for the consumer's dollar. The nature of the advantages sought may differ, but each company must be sure that its advantages are substantial enough to permit profitable operation. The company must also beware of the short-lived character of such advantages and must be constantly alert not only to maintain them, if possible, but to make certain that they are not losing their significance as profit factors. Continual effort should also be devoted to developing new competitive advantages.

For established companies continuous attention to redesign products along truly significant lines can serve several important purposes. In the first place, many industries have found it possible to attract new buyers and to stimulate replacement sales by steady improvement in performance, quality, and styling of product. And this often has been accomplished with no increase in price, because during the same period of time production methods have become more efficient.

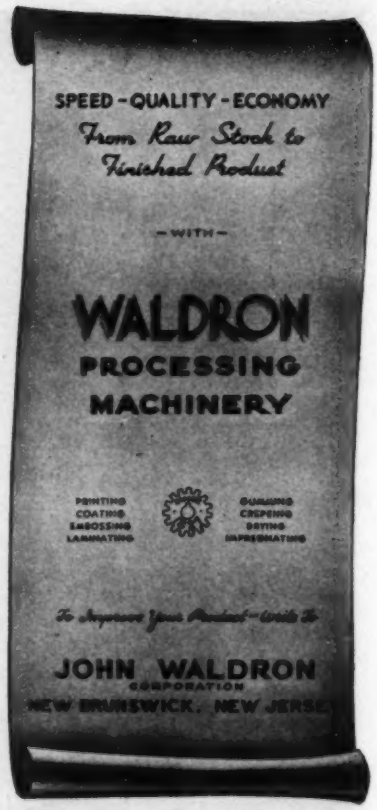
In the second place, product redesign focuses the attention of prospective buyers on desirable design and use characteristics of the product which cannot be found in exactly the same degree or in the same combinations among competitive offerings. Thus price cannot be used as the sole basis of comparison and there is much less likelihood of price wars which result from the efforts of certain sellers to stimulate sales by price reductions. While consumers should be able to secure needed products and services as inexpensively as possible, there is no assurance that excessive price competition will achieve the most desirable result.

A number of other objectives of product redesign may also be mentioned. Salesmen and distributors become bored with the same items and lose the touch of enthusiasm so necessary in successful selling. A new line, properly presented, has often had unbelievable sales results. Then there is the occasional problem of re-establishing a price level which has been forced down by an emergency situation.

Research concerned with product-planning is not an isolated function. Rather, it is properly a part of the whole "keep alert" purpose of the business. In this activity, as in others, management that goes to sleep frequently does not awaken until it is too late.

So much for a brief general discussion of the product-planning function in business. Let us now consider it in the glazed

(1) The authors are conducting a study of product-planning problems in the glazed and fancy paper trade. One or more visits have been made to almost all of the converters and to a number of jobbers, boxmakers and greeting card manufacturers. Of the information given, that part which is specifically concerned with the glazed and fancy paper industry was secured through personal interviews on a confidential basis. It is not possible, therefore, to make reference to the activities of companies by name nor to disclose specifically the sources of information.



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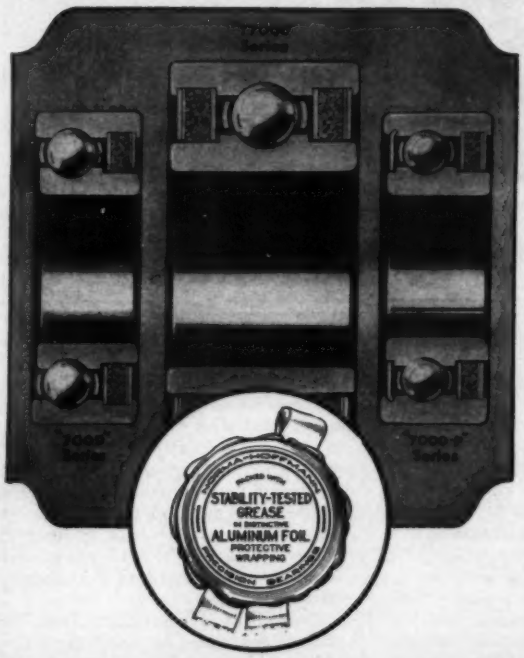

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and fancy paper industry. This industry, with estimated annual sales of approximately $9,000,000, is composed of about forty converters, most of whom are located in the northeastern section of the United States. The typical concern is of small size with sales of under $500,000 annually. A few converters sell direct to users through their own field sales force, but the majority use paper jobbers or a combination of direct sale in concentrated markets and jobber distribution in thin markets.

Set-up paper box manufacturers represent the largest single market and purchase about 60 per cent of all fancy papers sold. Second in importance are greeting card manufacturers who buy from 10 per cent to 20 per cent of total sales. The remaining markets are highly diverse and each accounts for only a small fraction of sales. They include such uses as gift wrappings, lamp covers, luggage coverings, display stands, and the like.

Time does not permit a detailed explanation of the many types of papers which the industry produces nor is such an explanation necessary for this audience. Among the types most important in point of volume sold are white and colored glazed, fancy prints, flints, plates and lithos and white and black embossed. Other types of less volume importance but often bearing higher profit margins are the waterproofs, metal foils, micas, casein metallics, and pyroxylins.

There are a number of factors which complicate the product-planning task in this industry. Most basic of these is the lack of growth among major markets for coated and fancy papers.

With a non-expanding market, competition is naturally very keen with each converter striving to maintain and to increase his share of the business. Price competition has been especially keen on "standard" items with consequent low profit margins. The urge is ever present to develop items which are out of the price competition area and which will yield satisfactory profits.

More attention is being given to attractive packaging and there is a greater tendency for customers to demand exclusive rights to the use of individual patterns. One company reports that in the last ten years the number of individual items offered to the trade has increased from about 400 to almost 10,000 with only a moderate increase in total sales.

With this increase in variety of items there has been a natural shortening of the sales life of those items which sell in sufficient volume to earn profits.

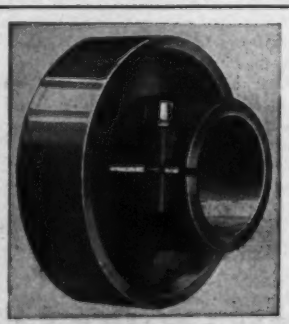
Perhaps most important is the trend toward the coating and finishing of papers by the base paper mills. A number of mills have seen in such lines an opportunity to escape from the low profit, standardized, tonnage products. Inasmuch as they cannot make short runs economically they have concentrated on the types of papers for which there is a fairly large demand. With larger runs than the average converter as well as certain other cost advantages, these operators have secured large amounts of business formerly sold by converters. This has had a serious effect as such business aided substantially in spreading overhead expenses. One converter's sales of white glazed paper used on shoe boxes and other volume business decreased during the past ten years to less than one-fifth of its previous normal amount. There is little likelihood that the members of the industry in their position as converters will be able to regain the lost business. On the contrary, there are many evidences that further inroads will be made into what converters have considered as their legitimate market.

Then there is competition from lithographed box wraps on set-up paper boxes. Lithographing permits very attractive treatments, especially product illustrations, and many manufacturers have adopted this type of box covering, with a resulting decline in volume of coated papers used. Some competition is also encountered from uncoated papers due largely to their lower price. While significant in some instances, this does not appear to be as serious as the use of lithographed box wraps.

Finally, there is some competition from improved and substantially more efficient processes for producing high gloss paper similar to flints.

In view of the complications introduced in the product-planning task of fancy paper converters by limited markets, great variety and turnover of items, and strong competition from without the industry, it is interesting to consider briefly what methods are in use and how the work has been organized.

Selection of designs for fancy papers is



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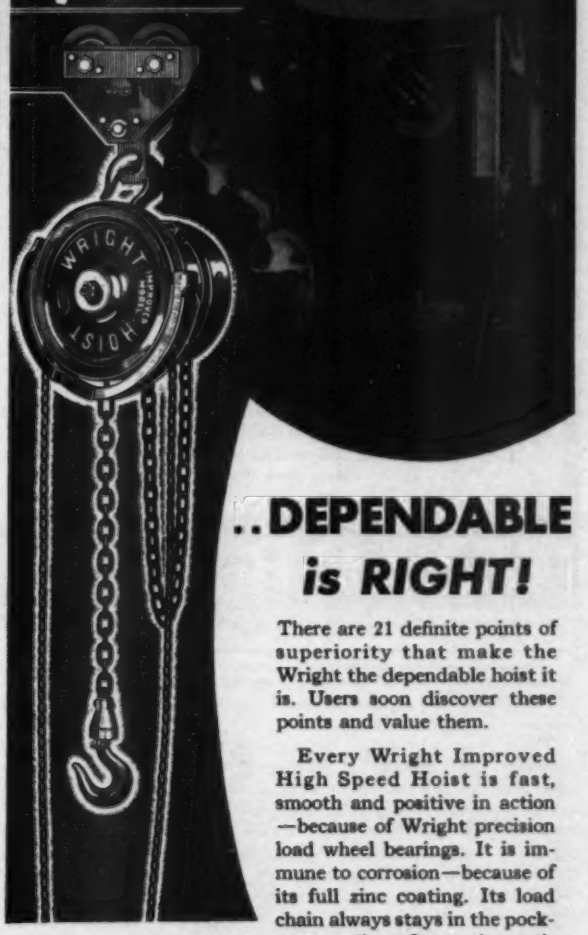

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governed largely by the intuitive judgment of individuals who occupy responsible positions in the organizations.

There is a widespread feeling among converters that selection of successful designs through any orderly or logical process is impossible and that a large amount of intelligent guesswork must always be present. They reason that long experience develops a discriminating judgment and that beyond this little can be done except to offer a sufficiently wide line so that there is a good chance of some items selling profitable volume and carrying the losses on those which do not prove popular.

Despite the frequency with which such comments were met, further questioning developed that certain converters, and usually the more successful ones, were nontheless following procedures which tended to supplement their intuitive judgment.

Although supplements to intuitive judgment do help somewhat to narrow the area of guesswork and at least provide more of a logical basis than the converters themselves are willing to claim, it still remains true that the product-planning task in this industry is handled in far from a scientific manner. Perhaps this is inevitably so, but we cannot fully agree. Unfortunately we have no detailed program to offer, nor do we expect to have when our study is complete. We do feel, however, that there are several things which the industry would do well to consider carefully and subject to experimentation.

In the first place, converters should appraise their economic strengths and weaknesses as a group. Their real strength lies in their being flexible to meet the varied demands of a market too small and fluctuating to provide the stability and long production runs needed for economical operation of the larger base paper mills. Their chief weakness is inability to compete on volume papers which do not require a high degree of finishing skill. A major effort of converters should rather be to capitalize their advantages by doing the best job possible in the field where they have economic advantages.

Another line of endeavor is new product research by the industry. An intelligent and carefully controlled program of diversification might well be considered.

When all is said and done, probably the most practical forward step is to recognize that in this industry product-planning is a vitally important task and that capable personnel should be sufficiently relieved of pressure of other duties to devote proper attention to it. Other industries have found definite placement of responsibility and adequate personnel to be essential. We see no reason why the same approach will not work in this industry.

Standard Casein

W. E. STRINGER, Sealtest, Inc.

Early attempts at the manufacture of casein consisted of allowing a batch of skim milk to develop its own acidity through natural fermentation. In this self sour process, the skim milk is usually inoculated with lactic acid producing bacteria and by holding the milk at a favorable temperature for bacterial growth, the milk sugar is converted into lactic acid. When sufficient acidity has developed, curdling is effected, and the combination of "curds and whey" results. At this point, the curd is broken up either by hand stirring or by heating with steam, or by both. After allowing the curd to settle, the whey is decanted. The curd is then washed with water, and the mass is hand stirred. After allowing the curd to settle, the water is drained. This operation of washing is repeated two or three times. The washed curd is pressed to remove excess water, shredded, dried and finally ground. Casein of this type is commonly known as lactic casein.

Another batch method of producing casein which is much faster than the self sour process is to effect quick coagulation of the skim milk by addition of a mineral acid. The procedure is to heat a vat of skim milk with live steam to about 95 deg. Fahr., then carefully distribute a known quantity of hydrochloric or sulphuric acid, diluted 1 to 10 with water; and, by means of hand stirring, thoroughly mix the milk and acid. The result is an immediate coagulation of the milk. The curd is then washed, pressed, shredded, dried and ground as in the foregoing procedure. Casein of this type is referred to as grain curd casein.

These two methods give a rought idea of how casein may be made. However, it can be readily understood that in any batch operations, either as just described or with modification of those methods, it is impossible to produce a uniform product continuously.

The necessity of a uniform casein for use in the manufacture of coated papers led to the development of the Sheffield Continuous Process. Elimination of variables is of prime importance in producing casein, and experimentation proved that control of both the precipitating temperature and the acidity at which precipitation of the casein took place, was largely responsible for the type of curd produced. We attain this control by the following procedure.

The skim milk entering the system is pumped through a thermostatically controlled, internal tubular heater. Close control of the precipitating temperature is thus effected. Skim milk enters the system at a temperature of 110 deg. Fahr. Hydrochloric acid (sp. gr. 1.20) diluted with four volumes of water is used. A float valve arrangement for constant level of acid in the acid storage supply provides a means of adding the acid uniformly. A specially constructed mixing device for controlling the curdling of the milk is the most important factor in the process. This apparatus consists of a ceramic cylinder with a slotted opening in the top for the introduction of acid and a side opening through which the heated skim milk is fed. An arrangement of downward sloping baffles within the cylinder insures an instantaneous mixture of acid and milk. In order to fully complete the reaction, the flow from the mixing device enters a stoneware box also provided with baffles. Here a slightly prolonged reaction is effected so that any unreacted skim milk may be acidulated and complete precipitation of casein obtained. Routine titrations

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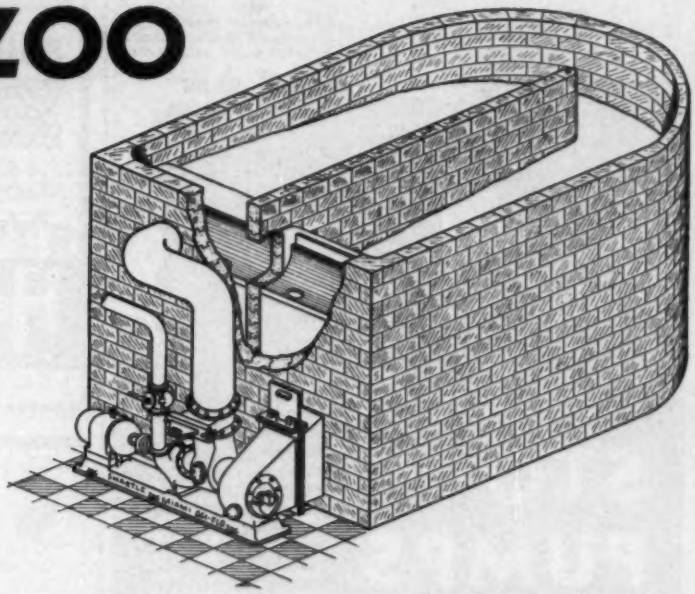


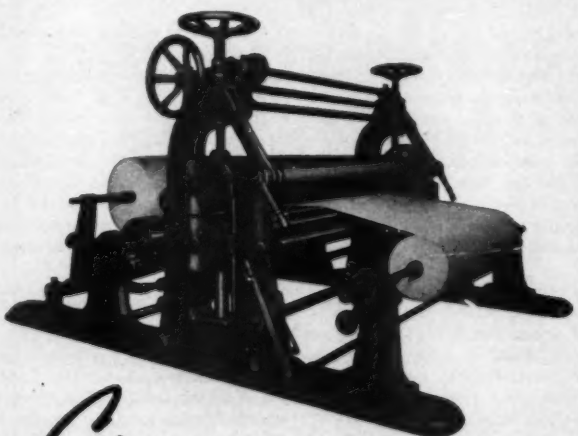
Illustration courtesy of Shartle Brothers Machine Company, manufacturers of the Shartle Agi-flo Pump

GLAZED TILE

KALAMAZOO TANK & SILO CO.

KALAMAZOO, MICHIGAN

WOOD



Standard EMBOSSER

For tissues, cardboards, cover stocks, offset papers, liner boards and other paper materials taken off jumbo rolls and delivered to the rewinder.

Unit illustrated has single drum winder but same unit may be furnished with double drum or friction shaft winder.

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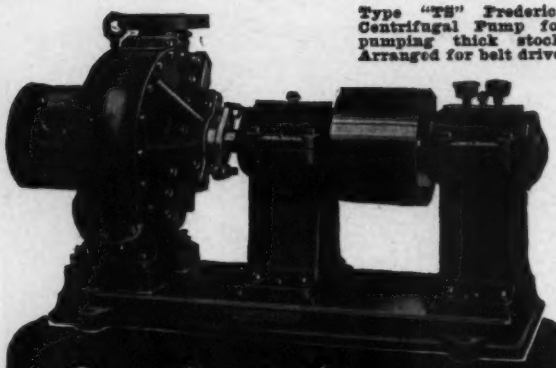

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are constantly made to insure uniform acidity.

From this point, the mixture of large clumpy curds and whey passes to an inclined screen trough through which the whey drains and from which the curds pass to an inclined screw conveyor. The function of this conveyor is to provide an immediate separation of the curd and whey.

At the end of this conveyor, the surface of the clumps of curds are substantially free of whey. They now drop into a beater arrangement wherein they are shredded into small particles by means of rotating beaters. A stream of water is sprayed on these particles. At the same time, they are forced through a perforated plate on to a second inclined washing conveyor. The washing operation is accomplished by means of a spray of water from a line of nozzles along the side of the conveyor. This intimate washing operation thoroughly removes the impurities in the form of water-soluble salts and free acid, and contributes largely to the low acid, low-ash casein which is produced by this process.

From the washing conveyor, the curds are discharged to a hopper. A novel feature of this hopper is that the back side of it consists of an oscillating plate that forces the curds continuously between a set of rolls. These rolls are arranged vertically and consist of an upper solid roll which is chromium plated and an under perforated brass roll. Excess water from the curd is removed through the perforated roll to a drain, and the pressed curd which adheres to this roll is removed continuously by means of a wooden knife. Here it passes to an automatic grinding and spreading device. This apparatus continuously discharges the ground curds in a uniform layer on to trays which are then racked on a truck and sent to the tunnel dryer. The casein is quickly dried at a temperature of about 180 deg. Fahr. in a rapidly circulating current of air.

The dried casein is finally ground to pass a 20-mesh screen and packed in 75 lb. three-wall paper sacks.

A good casein should be uniform in color, usually light yellow or creamy white; free from dirt and burned specks; free from objectionable odors; and ground to a uniform mesh. It should also be low in ash content; low in free acid; free from the presence of fats; free from foaming tendencies; and easily soluble within the specified degree of alkalinity. From the casein manufacturer's point of view these are the characteristics which determine the suitability of casein for use in coating papers. The paper coater, however, relies on an actual performance test run on a small scale. He desires a low viscosity, high solids-carrying solution which spreads easily without foaming. The highest pigment ratio at a given wax test is the goal, because this results in the best finish.

Casein is a substance which has a normal tendency to hydrolize. Prevention of this hydrolysis will permit better results by the user, because hydrolysis of casein reduces its adhesive strength. By the Sheffield process, about thirty minutes is all that is required to convert the fresh skim milk into casein ready to be dried.

Improper storage of casein may result in moisture contents, ranging from 4 per cent to 12 per cent, within the same room. Too low a moisture content is bad in that it tends to render the casein insoluble, while too high a moisture content increases the rate of hydrolysis. Putrefactive odors should be regarded as an indication of hydrolysis and breakdown of the casein, with its resultant loss in adhesive strength.

The disputes over the proper solvents for casein apparently originate in the difficulties encountered in dissolving low grade caseins of non-uniform properties. Where high grade casein is available no problem is involved. It dissolves easily. The proper solvent is also dependent on the quality of the paper being produced. However, it should be stressed that extreme care should be given to the amount of alkali used, and the usual trend is to use too much alkali. Fifteen per cent of borax is usually recommended as the standard amount of alkali necessary to put casein into solution. However, with the improved methods of manufacturing casein, this appears to be too high a limit; and solubility tests on high quality casein made by a continuous process indicate 10 to 12 per cent solutions of borax are sufficient. The use of alkali in excess of that amount required to dissolve the casein will result in burning or darkening the solution, loss in adhesive strength and loss in working life, regardless of the original quality of the casein.

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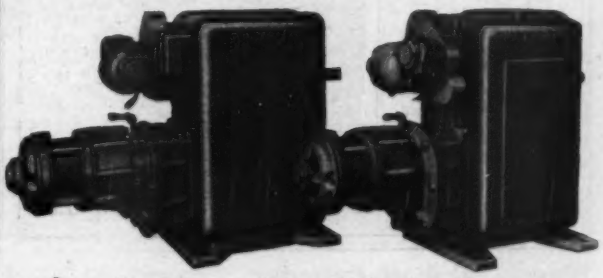

One unit controls spindle speed—the other, feed screw speed. Both units are required to operate in verticle and horizontal position during the cycle of operation.

The spindle control may be set for any desired speed. When the stop button is pressed, the spindle is reduced to minimum speed before the motor circuit is opened. Should the machine be stopped suddenly, the spindle will return to slow position before starting. Thus the spindle of this very heavy machine always starts at the slowest speed, then accelerates at a controlled rate, to the preset operating speed.

Since the operation generates a certain amount of heat, the temperature of the material increases thereby causing it to elongate gradually and slowly. The speed of the feed screw is accelerated automatically and minutely, at the rate of elongation, to maintain the operation at a constant rate.

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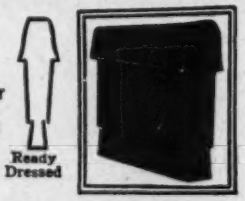

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ARTHUR B. GREEN, Engineer in Paper Making
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Bleach Sulphate Cylinder Papers

A. B. MOORE, JR., Chief Chemist
Crossett Paper Mills

The purpose of this paper is to give specific information and experiences from an operation of approximately eight months duration in a field that is comparatively new in the South. To do this it is first necessary to outline the conditions and equipment which were factors in the results obtained.

The bleaching plant is a modification of the Thorne design, erected and equipped by Improved Paper Machinery Corporation, and operates on a batch system for the final hypochlorite stage—a fact which permits the production of a white and a semibleached pulp in close enough time intervals to be run simultaneously on the paper machine. The plant bleaches in either three or four stages as required.

Two separate stock systems were available to the machine. On one system the refining equipment consisted of Dilts Hydrafiners connected in series followed by a No. 6 Miami Jordan; the second system was made up of two Vortex beaters followed by a No. 6 Miami Jordan.

The machine is of conventional design and is equipped with five 36 in. by 90 in. cylinders, five primary and three straight presses.

Bleached pulp as it leaves the bleach plant is a free stock, around 885 on the Schopper-Riegler freeness tester, and is characterized by a rapid Mullen development curve in relation to freeness; an average maximum development falls between 750 and 800 in the laboratory beater. The semibleached pulp develops similarly to natural kraft, i. e. relatively slow, with a peak Mullen reached near 700 freeness. Over bleaching, too high temperatures, incomplete washing or other improper practices in the bleaching operation produce a degraded pulp fiber which reflects in decreased strength, especially in tearing resistance.

The bleached kraft, both semi and full bleach, exhibits the property of forming a close, dense sheet with a minimum amount of hydration. The term, hydration, is used to indicate a refining action opposite to cutting. A high density as compared to fourdrinier products is characteristic of cylinder machine operation, but this feature is accentuated by bleached kraft to such an extent that even on the higher calipers that are ordinarily manufactured from a fairly free stock it is possible to obtain densities that are advantageous to a converter who desires a resistance to the penetration of liquid or a surface coating with a minimum penetration into the body of the sheet.

In processing bleached and semibleached grades, one of the first questions asked by the converter is, will it print? Probably the best answer is that from the trade itself. Since the establishment of the various grades the answer has been very favorable with the possible exception of the lower calipers of white lined, semibleached back which gave annoying difficulties in the beginning. However, better control of stock preparation and formation have given very encouraging results.

Bleached lined cylinder boards have long been converted into more specialized cartons for the food, drug, and can trades, but usually with an unbleached sulphite, but sometimes groundwood filled back or with a chip back. The same board when made from bleached and semibleached kraft pulp has been found to give an all-round stronger sheet—one on which the caliper may be lowered from one to three points, depending on the original caliper, and still produce a carton of equal or greater strength.

The high density as determined by the Gurley Densometer indicates a sheet that is very well adapted to any kind of product that must have a maximum resistance to liquids or to waxing processes in which there is an advantage, in retaining as much was as possible on the surface.

What has already been said in regard to the strength characteristics of bleach lined semibleach back boards applies to the solid bleached board for carton conversion. Just recently the first order of solid white converter tag has been manufactured and while it is yet too early to comment on the market possibilities, preliminary examinations show a sheet that follows the strength motif of the other grades.

Because of high machine direction stiffness, which concentrates rigidity where it is needed, and of relatively low calipers in comparison with Fourdrinier papers, which saves space, cylinder papers are very suitable for file folders.

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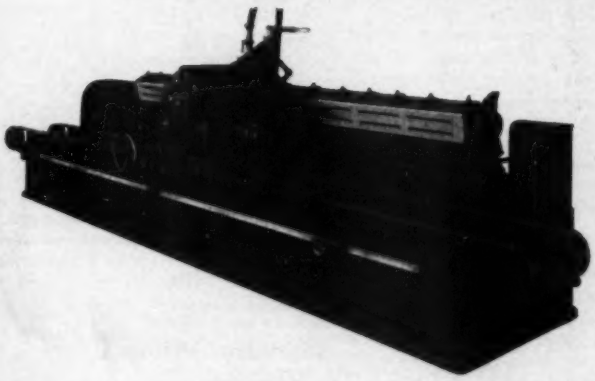

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NATIONAL SAFETY COUNCIL, Inc.

20 NORTH WACKER DRIVE **CHICAGO, ILLINOIS**

NEW EQUIPMENT AND SUPPLIES

High Pressure Porosity Tester

A new model of the *Gurley Densometer*, arranged to give convenient readings on glassine, waxed paper, cigarette tissue, condenser tissue, and other porous but dense sheet materials, has been announced by W. & L. E. Gurley, Troy, New York. In the operation of this instrument, air, under uniform pressure, is forced through an area of one square inch of sample, and the time noted for the passage of a given volume. The air pressure, equivalent to 12 in. of water, is furnished by a graduated inner cylinder or piston, floating in mercury contained in the outer cylinder. The inner cylinder is standardized as to volume and weight, and is graduated to 5 cc. Readings are taken by a stop watch as the graduations pass the top edge of the outer cylinder.

The air is conducted through an open-ended tube extending through the mercury to the surface of the sample, through which it escapes. The sample is clamped between the orifice plates having optically flat contact surfaces.

Minimum readings with this instrument require only about one-twentieth the time required by the regular Densometer, and hence make this test applicable to a wider range of papers.

Paper Roll Truck

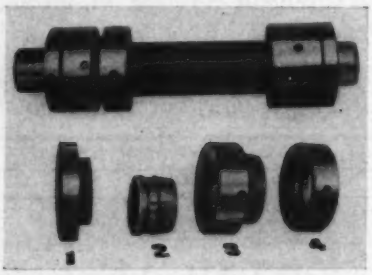
Barrett-Cravens Co., 3250 West 30th Street, Chicago, Illinois, has announced a paper roll truck of unusually unique design. The truck is of all welded construction. It consists of two vertical supporting

members, two spindle supporting arms, a spindle, two front and two rear wheels, and a framework and handle arrangement to complete the assembly. The two vertical supporting members are toothed to engage the spindle supporting arms so that they can be adjusted for rolls of any diameter from 48 in. to 96 in. The front wheels are 9 in. in diameter; the rear wheels, which swivel, 4 in. in diameter. All wheels are mounted on anti-friction bearings. The truck is available in three different inside clearances, namely: 36, 42, and 48 in.

To lift a roll, the truck without spindle is made to straddle it. Then the spindle is run through the eye of the roll, the spindle arms raised to slightly higher than the spindle's height, and the truck moved forward, the rear end being lifted at the same time so as to engage the arms under the spindle ends. Next, the operator bears down on the handle, and, as the rear wheels contact the floor, the roll is lifted and becomes entirely supported by the wheels.

Drum Winder Collar

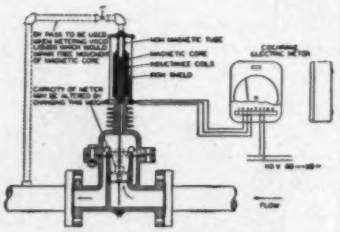
Gilbert & Nash Company, Inc., Menasha, Wisconsin, has announced the development of a safety collar for drum winders. The collar, built to customers specifications, consists of an expansion chuck and a back



member. The chuck (see illustration) includes (1) a threaded head, (2) a collet against which the threaded head is drawn, (3) a housing for the collet (4) and an expansion nut that draws up the core alignment. A spanner wrench, supplied with the collar, is used to pull up the threaded head.

Fluid Meter

The Cochrane Corporation, 17th Street and Allegheny Avenue, Philadelphia, Pa., has announced an area type meter for the measurement of flow of fluids having characteristics of viscosity, corrosiveness, solubility, etc., which are beyond the scope of the customary orifice type flow meter. The body of this meter, installed as an integral part of the pipe line, contains a weighted disc which is positioned by the velocity of fluid through a tapered throat section in such a manner that the disc travel is directly proportional to flow rate. Attached to the weighted disc is a rod and iron core, the latter of which traverses the field of two reactance coils surrounding the pressure tube of the meter body. These coils form a reactance bridge when connected electrically to similar coils in the indicating, recording and integrating instrument, and form the means of transmitting the measurements to any desired distance from the meter body. Measurement is accomplished in the recording instrument by use of the galvanometer null principle as applied to the Cochrane electric flow meter. The meter is made in different combinations of indicating, recording and integrating features to suit particu-



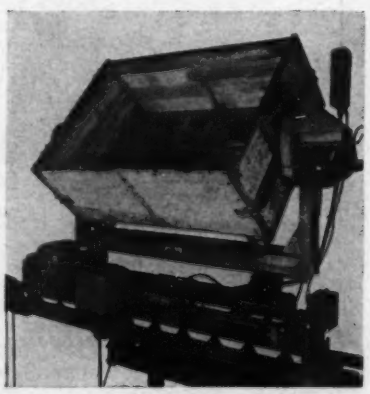
lar conditions, and may be equipped with pressure and temperature elements to record on the same chart with flow. Styles are available for wall, column or flush panel mounting.

Chlorine Pump

Milton Roy, 3160 Kensington Avenue, Philadelphia, Pennsylvania, has announced a pump for the handling of hypochlorite or chlorine solutions. The capacity of the pump ranges from 1 g.p.h. to 10 g.p.h. against pressures up to 100 lb. The pump is of the displacement type; its capacity may be regulated by adjustment of the length of pumping stroke.

Full-Rotation Box Grab and Tramrail Carrier

The Cleveland Tramrail Division of The Cleveland Crane & Engineering Company, Wickliffe, Ohio, has developed a full-rotation box grab and tramrail carrier for the conveying of a wide range of materials.



There is a twin-hoisting unit for raising and lowering the boxes; a gear-motor drive for rotating them to any position; a handwheel for clamping the boxes in position and a push-button station for the control of all operations.

The grab can be furnished for loads up to 5 tons, including box, grab and material.

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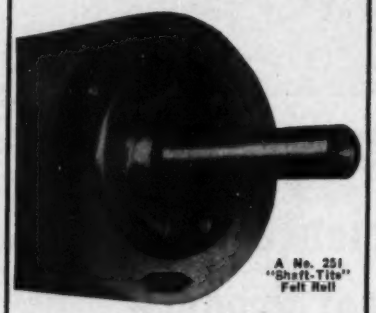

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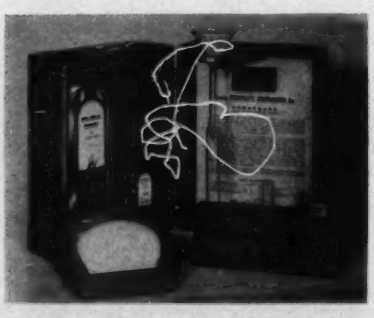
RODNEY HUNT MACHINE COMPANY

38 Maple St., Orange, Mass.

Phosphate Comparator Set

W. H. & L. D. Betz, 235 West Wyoming Avenue, Philadelphia, Pennsylvania, has announced a simplified comparator, designated as the Betz *Junior Phosphate Comparator Set,* for determining the soluble phosphate content of boiler water. The set consists of a wooden cabinet, removable comparator block with two permanent (maximum and minimum) color standards, two graduated mixing tubes with rubber



stoppers, two graduated test tubes, one 20 cc. vial and graduated pipette, one extra graduated pipette and nipple, one 2 in. funnel with extra long stem, one box No. 5 Whatman filter paper, one 16 oz. bottle Molybdate Reagent, one 1 oz. bottle Stannous Chloride (Concentrated), together with complete instructions.

The manufacturer states that a complete determination can be accomplished with this set within three to five minutes.

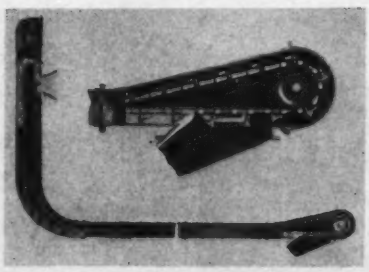
Infrared Drying Lamps

A new line of infrared drying lamps, designed for industrial drying and heating jobs, has been announced by the Westinghouse Lamp Division, Bloomfield, New Jersey. The new line includes a 250-watt lamp with pear-shaped clear glass bulb and medium screw base; a 250-watt reflector drying lamp in inside-frosted R-40 bulb, also

with medium screw base; and 500 and 1000-watt lamps in clear glass, globular bulbs, both with medium bipost bases, for heavy duty work. All are designed for use on 105 to 120-volt circuits. With the exception of the reflector drying lamp, all should be used in conjunction with especially designed aluminum or gold-plated reflectors. The reflector drying lamp is a self-contained lamp and reflector, incorporating a metallic reflecting coating which is applied to the inside of the bulb, then hermetically sealed in the bulb, and thus protected from dust, dirt, moisture and deterioration. Rated laboratory life of each of the new lamps is in excess of 5,000 hours.

Elevator-Conveyor for Granular Material

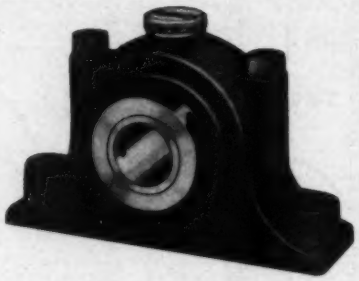
The Jeffrey Manufacturing Company, Columbus, Ohio, has announced an elevator-conveyor unit for the handling of coal, sawdust, dry chemicals, and other similar



materials. Known as the *Mass-Flo* elevator-conveyor, the unit consists of a series of solid pivoted flights spaced on a single strand of chain and the arrangement housed within a steel casing. The unit is self-feeding and self-cleaning.

Double Interlock Pillow Block

Dodge Manufacturing Corporation, Mishawaka, Indiana, has announced a pillow block, designated as the *Dodge-Timken Double Interlock Pillow Block,* for mounting on ordinary commercial shafting. This pillow block uses a special duplex Timken roller bearing with long extended inner race-ring extending completely through the housing, thus providing a completely enclosed bearing. To secure the bearing to the shaft on which it is mounted, collars with two setscrews spaced at 120 deg. are placed on the outside of each end of the inner race-ring. These setscrews pass through unthreaded holes in the race-ring, bear directly on the shaft on the one side and clamp the race-ring directly against the shaft on the



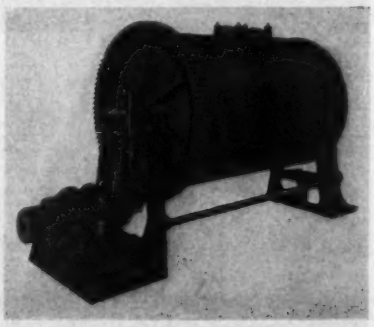
other side. This pillow block is made in both expansion and non-expansion types. The cap and base are machined at the joint to insure an accurate fit. The base of the outer housing also is machined. Labyrinth seals are provided to retain lubricant and to protect bearing against foreign material.

Safety Insole for Foot Protection

A flexible insole, built of two layers of overlapping steel strips molded in rubberized fabric, has been announced by Mine Safety Appliances Company, Thomas, Braddock & Meade Streets, Pittsburgh, Pa. This insole, designated as the M. S. A. Safety Insole, is supplied in full sizes from 6 to 12 inclusive. According to the manufacturer, the insole is remarkably light and flexible, bending freely with every movement of the foot, and yet fully capable of preventing injury from penetration of the boot-sole by sharp pointed objects.

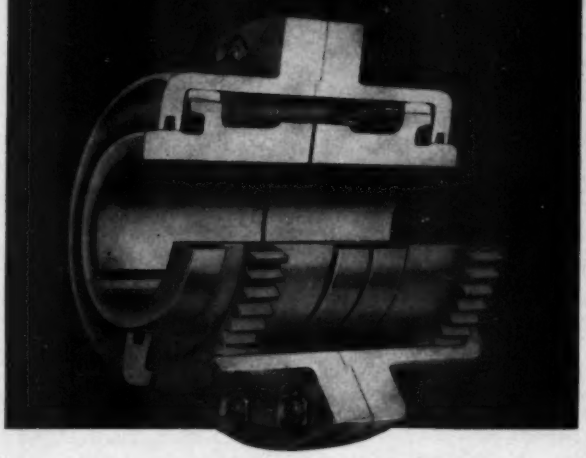
Ball Mill of Welded Steel Construction

Abbe Engineering Company, 50 Church Street, New York, New York, has announced a ball mill of welded steel construction with shell of high carbon or chrome manganese alloy steel. The unit, a style *GPH mill,* is mounted on pedestals with broad feet. The pedestal on the drive



end has the motor base built integral with it. A geared head motor rests on a machined base. In addition, there is an inching magnetic motor mounted brake and a push button control for starting, stopping and inching the mill to desired position and holding it there for charging or discharging.

POOLE



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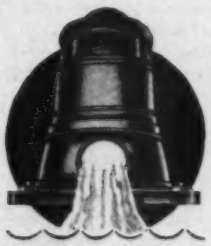

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TECHNICAL DEVELOPMENTS

The following abstracts are of the latest developments found in the foreign press.

Alcohol Yields in the Sulphite Process

Abstracts of 3 Swedish papers are given. In the first, experiments for obtaining the highest possible yields of alcohol are discussed. There is no advantage in direct hydrolysis of spruce chips with sulphurous acid over those of a modified sulphite digestion. In either case, 60-70 liters of absolute alcohol were obtained. The alcohol yield rises when the calcium content of the cooking liquor is kept low, and the delignification allowed to proceed to a low chlorine number. Maximum alcohol yields were obtained when an easy bleaching pulp was formed in a single-stage cook, using the lowest possible lime content in the liquor and cooking for the shortest possible time. The pulp, however, is of inferior quality, although still suited to certain lower grades of paper, like newsprint. Beyond this cooking stage a low viscosity pulp is obtained which lends itself to use as a feed for cattle and horses (but not hogs). In such cases too, due to protracted cooking, the alcohol yield decreases. In the second paper, studies are recorded which entail optimum cooking conditions for obtaining highest alcohol yields in a two-stage cook, without injury to pulp quality or yield. Low lime and relatively high sulphur dioxide content were used in both stages. It was important that at least 75 per cent of the sugar formed be removed during the first stage, with the discharge of waste liquor, without an intermediate washing prior to the second phase of the cook. This was found to be possible in vertical but not in horizontal commercial digesters.

When cooks were carried out on a laboratory scale, an intermediate wash had to be included to insure freedom from burnt cooks, due to the higher concentrations of sugar. The liquor concentration in the two stages is regulated depending on the pulp qualities desired. When easy bleaching pulps are to be produced, a very low lime content may be used, and the alcohol content rises to about twice that of a one-stage cook. For the formation of stronger pulps a higher lime content is required, and then the possible alcohol yield decreases. In general it may be said for two-stage cooks, that pulps can be produced by them with properties identical with those found in pulps produced in a single stage process, while the alcohol yield is doubled. The third paper is a critique of the other two. Here the investigator was able to obtain 72 liters of absolute alcohol for every 1,016 kilos of strong sulphite pulp (Roe number 9.8) and 105 liters of alcohol for the same amount of easy bleaching pulp (Roe number 2.5). He therefore questions the advisability of introducing modifications into the one-stage or two-stage cooks, which give only slight advantages in alcohol yield and which generally yield a poorer pulp quality, with increased production costs. (1) D. Johansson; Svensk Papperstidn. 42, 582-8; (2) H. Nihlen. Ibid. 42, 593-9; (3) C. R. Bergson. Ibid. 43, 2-4 (Jan. 1940) through Bull. Inst. Paper Chem. 10, 213-4; 262 (1940).

Sweet Sorghum Pulp

Italian industrial experiments with sorghum stalks, using a monosulphite cook, gave a pulp that could be bleached with hypochlorite containing 3-4 per cent active chlorine. The bleached pulp yields after removal of medullary rays and short fibers approached 35 per cent. By mechanical improvements, present yields on dry material could be increased to about 50 per cent. C. Levi and E. Debenedetti. Atti. X° congr. Intern. Chim. 4, 155-6 (1939); through C. A. 34, 2169 (1940).

Ozonization in Formic Acid

This is a preliminary study carried out by the authors before attempting to study birch formic acid lignin. It was found that when ozone acts on such substances as maleic acid, vanillin, or veratric acid dissolved in ethyl acetate, the compounds formed are products in which the aldehyde groups are largely oxidized. On the other hand, formic acid as solvent, has a remarkable tendency to protect the aldehyde group from oxidation to the carboxyl group. Thus in formic acid, maleic acid is oxidized only to glyoxylic acid; while vanillin and veratric aldehyde are in large measure recovered after ozonization. R. M. Dorland and H. Hibbert. Canadian J. Research. 18, 30 (1940).

Hydrogenation of Sulphite Waste Liquor

Waste liquor which had been acidified with sulphuric acid was treated with steam at 100 deg., and evaporated to dryness, a procedure which later saved much hydrogen since half of the fixed sulphur was removed as SO_2. The yield of this initial material was about 70% of the weight of dry residue obtained simply by direct evaporation. This initial material was then suspended in a heavy oil (obtained in the hydrogenations), in such a ration that the solid to oil was 2:1. At the temperature range of 140-170 deg. C. the consumption of hydrogen was first noted. On heating further, up to 300 deg. C. the hydrogen used up is negligible, but consumption is again noted above 300 deg. Heavy oils, in good yield, with the virtual absence of light oils were obtained when hydrogenation was carried out not above 340-350, but a sharp increase in low boiling fractions occurred when the temperature was raised above 400 deg. Such light oil fractions boiled below 150 deg. By heating for 6 hours at 350-400, a total yield of 55% oils were obtained of which 40% were light. Below 350 the light oil fractions were not over 8% of the total. A solid residue, containing 50% ash and carbonaceous material remained after the hydrogenation. This amounted to 18%. So-called destructive hydrogenation must be preceded by thermal decomposition, whereas controlled hydrogenation, as exemplified by the reduction of hydroxyl groups in converting hydroxy into fatty acids, must be carried out at temperatures below those of thermal decomposition. This thermal decomposition appears to take place at 270-280 deg. P. A. Bobrov and L. I. Kolotova. Compt. rend. Acad Sci. U. S. S. R. 24, 46-8 (1939) (in English). Through C. A. 34, 884 (1940).

Changes in Properties of Wood and Cellulose on Grinding

There is a correlation between reactivity of cellulosic materials and their fineness of division. Beechwood, ground in the so-called *Vibratom* mill, gives a fine powder on dry grinding (particle size is 1-2 microns). After grinding, these particles are separated on short treatments with water, alcohol, and ether. Compared with wood pulverized in a crusher where the particle dimension is 270 microns × 1.5 mm., the reactivity is considerably greater. Under normal methylation, the fine powder takes up 36 per cent methoxyl in one step, while the coarse particles take up 24-7 per cent. This more completely methylated wood is almost entirely soluble in benzoic acid. On acetylation the fine powder (using acetic anhydride and pyridine) yields a wood acetate with 40 per cent acetyl. Cellulose fibers are also much more reactive after grinding. K. Hess, K. P. Jung, and K. E. Heumann. Naturwissenschaften 27, 770-1 (1939) through C. A. 34, 2170 (1940).

Slime Control in a Paper Mill

This deals with the control of slime at the Ontario Paper Co., Ltd. Four types of slime producing organisms were found, and these could be checked by the judicious use of chloramine. The white water from the groundwood decker sump was treated, as well as the water returned to the paper machine, white water from a sulphite decker sump, and the general fresh mill water supply. During the colder months, the chemical consumption was about 1.87 lb. chlorine and 0.16 lb. NH_3 per ton. During the summer months, this requirement rose so that at a maximum it became respectively 3.54 and 0.295 lb. As the temperature of the fresh water supply dropped, this could be reduced to 2.26 and 0.147 lb. Cl and NH_3. There are savings in this treatment due to increase in the production of finished paper, due to higher machine efficiency, lowered stock losses, and decreased labor costs where fewer wash-ups and pipe line cleanings are required. Power and steam consumption also decreased. J. M. Forrester and F. G. Kirby, Pulp and Paper Magazine of Canada, 41, 83-6 (1940); through Bull. Inst. Paper Chem. 10, 259 (1940).

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PAPERMAKING PATENTS

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Inquiries should be addressed to James Atkins, Munsey Building, Washington, D. C.

V Type Bedplate for Paper Pulp Beaters

Patent No. 2,174,774. Archer Le Roy Bolton, North Andover, Mass., assignor to John W. Bolton & Sons., Inc., Lawrence, Mass., a corporation of Massachusetts. Application July 8, 1936, Serial No. 89,540. 3 Claims. (Cl. 92—22). A bodily transportable bedplate made up of angular holding knives which are so bent that their ends converge from the front toward the center of the back at a relatively small angle with the base; intermediate knives between the front and back bent holding knives which converge from the front toward the center of the back at a relatively great angle with the base; together with means to hold the bedplate assembly together as a bodily transportable unit.

Industrial and Paper-Makers' Felts

Patent No. 2,165,772. Patrick H. Walsh, Boston, Mass., and Percival T. Gates, Montclair, N. J., assignors to Drycor Felt Company, Belleville, N. J., a corporation of New Jersey. Application May 4, 1937, Serial No. 140,652. 1 Claim. (Cl. 28—4). As a new article of manufacture, papermakers' felts in the form of an endless belt for use in papermaking machinery, made by needling a plurality of fleeces to a base fabric, said fabric consisting of non-stretching ply strands forming the warp, with cable twisted strands constituting the filling, a plurality of fleeces needled to the opposite surfaces of said base material, the top surface comprising a closely needled smooth fleece for carrying pulp material, and the bottom surface comprising a fleece of coarser form permitting drainage from the pulp material therethru free of clogging, and said coarser fleece constituting a wear-resisting surface for driving over pulleys.

Paper Machinery

Patent No. 2,164,445. Adam E. Bridge, Franklin, Ohio, assignor to The Black-Clawson Company, Hamilton, Ohio, a corporation of Ohio. Application December 5, 1935, Serial No. 53,026. 3 Claims. (Cl. 285—10). In combination, a hollow rotatable roll having a hollow journal shaft providing communication to the interior of the roll, a stationary steam supply fitting having a steam supply chamber in communication with the passage in the journal shaft, a condensate withdrawal means in said passage supported by said fitting and having an extension reaching to a low point within the roll, a pipe for withdrawing condensate from said fitting, said shaft having a shoulder extending outwardly from the shaft axis and providing an abutment face facing toward the roll, said fitting enclosing said shoulder and having an abutment face facing away from the roll, packing between said shoulder and fitting and normally held compressed by the pressure of the steam supplied to said fitting the packing having a conical abutment surface interfitting with one of said faces, said shoulder packing and fitting maintaining the fitting coaxially with the shaft, spring means holding the shoulder and fitting yieldingly in bearing relation with one another, and means for supplying steam to said fitting.

Apparatus for Making Paper

Patent No. 2,168,996. Gerould T. Lane and Wendell Butterfield, Rochester, N. Y., assignors to Eastman Kodak Company, Rochester, N. Y., a corporation of New Jersey. Application May 18, 1937, Serial No. 143,336. 8 Claims. (Cl. 92—42). In a paper making machine, the combination with a stuff chest in which the cylinder is revolvably mounted a stuff inlet, a plurality of stream lined partition plates forming a number of substantially concentric vat circles, the end of each vat circle being formed inwardly toward the cylinder.

Manufacture of Calcium Sulphite Filled Paper

Patent No. 2,154,995. Francis G. Rawling, Piedmont, W. Va., assignor by mesne assignments, to West Virginia Pulp & Paper Company, New York, N. Y., a corporation of Delaware. Application December 17, 1934, Serial No. 757,888. 9 Claims. (Cl. 92—21). The treatment of paper pulp containing calcium sulphite as a filler, comprising the step of beating said pulp in the presence of water and a sufficient quantity of a water soluble non-reducing salt of an acid whose calcium salt is less soluble in water than calcium sulphate to offset the conversion of calcium sulphite to calcium sulphate in said pulp, said salt being capable of reacting with calcium sulphate.

Apparatus for the Manufacture or Production of Laminated Sheet Material

Patent No. 2,158,754. Theodore A. Hodgdon, Whitingham, Vt. Application August 25, 1936, Serial No. 97,733. 3 Claims. (Cl. 154—37). In combination, in a machine for laminating glassine paper, a pair of pressure rolls, a receptacle containing hot liquid wax at a temperature between 175°-190° F. in which one of said rolls is partially immersed, means for feeding two webs of glassine paper to said rolls in opposed relation to each other with one of said webs passing through said receptacle and around said immersed roll and separating said immersed roll from said wax, whereby, as the pressure rolls are driven, opposing surfaces of said glassine paper will be coated with hot wax adjacent the nip of the pressure rolls, an adjustable tension roll for imparting high tension to said immersed web of glassine for excluding the hot wax from between the immersed pressure roll and the web of glassine, whereby only one surface of the web passing through the receptacle will receive a coating of the wax.

Fiber Pulp Refiner

Patent No. 2,156,320. Daniel Manson Sutherland, Jr., Morrisville, Pa., assignor to Lionel M. Sutherland, Trenton, N. J., and Douglas G. Sutherland, Morrisville, Pa. Application April 1, 1936. Serial No. 72,082. 9 Claims. (Cl. 92—26). A fiber pulp refiner comprising relatively revolving coaxial refining members with opposed coacting working faces substantially parallel and enlarging outward around their axes, and traversed transversely of the circumferential direction of the relative movement of their said faces by the fiber stock being treated, at least one of said refining members having its working face movable in the axial direction toward and from the other member, and including means for applying sustaining fluid pressure behind said face to maintain it in effective coaction with said other member.

Apparatus for Pressing a Moving Web in Paper Making Machines

Patent No. 2,174,744. Harold S. Hill, Quebec, Canada. Application February 3, 1937, Serial No. 123,908. 3 Claims. (Cl. 92—49). In the manufacture of paper, apparatus for pressing the paper web comprising a rotatably mounted roll over which the web passes, a casing enclosing that part of the roll over which the web passes and forming at least one fluid pressure chamber extending around a portion of the surface of the roll, an impervious belt disposed around the roll engaging and confining the web as it passes over the roll and sealed against the casing, and means for introducing a fluid under pressure to said chamber to exert pressure on said belt.

Paper and Method of Making the Same

Patent No. 2,173,167. Rexford William Hovey, Bronxville, N. Y., assignor to Oxford Paper Company, a corporation of Maine. Application June 26, 1937, Serial No. 150,539. 7 Claims. (Cl. 92—21).

Groundwood paper made from a furnish containing groundwood pulp as part of the fibrous constituents and alkaline carbonate filler, the major portion of the balance of the fibrous constituents of the furnish consisting of at least one pulp of the papermaking group consisting of sulfite pulp and soda pulp, the groundwood being present in the paper to the extent of at least 20% of the fibrous constituents of the paper and said alkaline carbonate filler being present in the paper in excess of 10% of the weight of the paper, the brightness of the paper being enhanced by the presence of the alkaline carbonate filler.

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New Catalogues and Publications

Acme Electric and Mfg. Co., Cuba, N. Y.—An interesting bulletin entitled "Light for Work," which describes this company's mercury vapor transformers for indoor and outdoor applications, has been released lately. The bulletin (No. 149) explains the characteristics of mercury vapor lighting, the various types of lighting systems for specific and general applications. Illustrations and specifications are included.

Aeolus Dickinson, Chicago—A well-illustrated catalogue containing photographs, cross-sectional drawings and data on the ventilators, roof drains, fan units, etc., produced by this company, has been released lately. Installation views are shown and there is extensive written material explaining the various features of the units. Special attention is given to explaining the operating funtions of the company's fans and ventilators.

Bagley and Sewall Co., Watertown, N. Y.—A very handsome, well laid out publication which explains the manufacturing service offered by this company has been released recently. The spiral-bound publication is simply, yet effectively, written, and contains numerous page-size photographs. Its 32 pages tell an interesting story of this company's facilities for the manufacture of its products. The publication is divided into such sections as precision grinding, grinders, wood department, roll department, shipping, precision, power, engineering, pattern-making, foundry, vertical mills, horizontal mills, planers, and gear-cutting.

Chemical Publishing Co., New York, N. Y.—The new 1940 catalogue of important technical and scientific books published by this company, has been issued recently. Books of importance in all technical and scientific fields have been added to the previous edition. Chemists, engineers, metallurgists, technicians and scientists will be interested in obtaining a copy of this catalogue.

Cooper Alloy Foundry Co., Elizabeth, N. J.—New literature describing this company's split clamp for Van Stone type joints for use on stainless steel or other alloy pipe connections, has been issued lately. The company has also released similar literature, all punched for loose-leaf filing, on its stainless steel cast butt welding fittings and flanged fittings furnished with carbon steel split back-up flanges.

Flexible Steel Lacing Co., Chicago—This company's "Flexco" HD belt fasteners and rip plates are described in a new bulletin (F-100) issued recently. The bulletin gives complete details and list prices for six sizes which can be used to join conveyor and elevator belts from ¼-inch to 1¼-inch thick of any width.

Grinnell Company, Inc., Providence, R. I.—An extremely interesting and very extensive catalogue on "Specialties for the Pulp, Paper and Chemical Industries," has been published recently by this company. The catalogue contains 142 pages of detailed data on the company's valves, couplings, thermometers, gauges, steam and air traps, controllers, regulators, strainers, pipe and tubing. This catalogue contains numerous photographs and drawings and groups, in logical order, a wide variety of equipment used by the processing industries. Included in this very informative work are data on pulp and paper stock valves (list prices, dimensions, weights and features), globe and plug type valves, gate valves, check valves, ball plug valves, safety valves, etc. This catalogue, complete in every way, should find a place in every papermaker's industrial library.

Hauser-Stander Tank Co., Cincinnati.—Fully illustrated and containing extensive written material, this new catalogue (No. 40) describes the construction and uses of the various types of wood tanks manufactured by this company. The catalogue, entitled "The Book of Tanks," is of handy 6x9 size and contains many installation views of the company's sulphite liquor, acid storage and rubber-lined tanks in addition to stuff chests, blow pits and cylindrical pulp tanks. Diagrammatic drawings are featured throughout as are dimensional and research data. This catalogue would be of interest to every papermaker.

Jeffrey Mfg. Co., Columbus, Ohio—An interesting little booklet (No. 733) entitled "What We Make" has been issued by this company. Thirty-one pages in length, this booklet contains numerous photographs showing the many products manufactured by the company, including a page of pulp and paper mill equipment.

Leeds and Northrup Co., Philadelphia—A very pertinent broadside entitled "Cost-Saving Instruments for Pulp & Paper Mills" has been published recently by this company. The broadside contains extensive data relative to the company's electrical measuring instruments as used in the pulp and paper industry including relevant material on sulphate and soda pulps, paper, laboratory and power plant. Papermakers will find this release of great interest. The broadside may be procured by addressing the company at 4904 Stenton Ave.

Lukens Steel Co., Coatesville, Pa.—A most informative and comprehensive publication on spun heads for boilers, tanks, pressure vessels, etc., has been issued by this company. The spiral-bound, 132-page manual contains considerable data which, the company claims, has never been published heretofore. Prefaced by a history of machine-spinning the manual gives essential data for many types of heads, including, flanged only heads, standard flanged and dished heads, flanged and dished A.S.M.E. code, elliptical dished, A.S.M.E. code, and many others. All information essential to the calculation of process for forming spun heads is included in this valuable publication. Designers and fabricators of paper mill equipment will find this publication of great worth. Seventy interesting illustrations of usual and unusual uses of heads are included, among which are several of paper mill application.

Manning, Maxwell & Moore, Inc. (Hancock Valve Div.), Bridgeport, Conn.—A new bulletin (No. 5-7000) covering Hancock steel valves has been released lately. This 40-page bulletin contains complete dimensions of all types of valves and also complete material specifications of all metals used in the valves. In addition, the bulletin contains pages reproducing in full, the A.S.M.E. service rating tables. Numerous illustrations are included in this new bulletin.

Noble and Wood Machine Co., Hoosick Falls, N. Y.—An interesting little folder describing the equipment made by this company for control, pulp testing or research, has been issued lately. The company's sheet machine and cycle beater are illustrated and specification data are given.

Republic Flow Meters Co., Chicago—A very interesting publication (Data Book No. S-21) has to do with automatic combustion control for all sizes of boilers, all types of fuel firing and all load conditions. This well-written, well-illustrated publication explains automatic combustion control, goes into the basic problems of efficient boiler operation and describes the important features of the company's combustion control system. A number of highly-interesting installation reports, covering several paper mill installations as well as others, are included in this book. All the latter are illustrated with large diagrams and present performance data. This spiral-bound catalogue should be in every industrial library.

Republic Steel Corp., Cleveland—A colorful new catalogue, 40 pages in length and spiral-bound, contains extensive information on this company's double-strength steel, a high tensile, low alloy product. Illustrations are used effectively to show how this product is used and there is much well-written material.

J. E. Rhoads & Sons, Philadelphia.—Two new folders on this company's "Tannate" leather belting have been issued recently. One folder has to do with the leather belting for short center drives while the other release contains facts about the company's watershed belting. Brief written material points out various features of the product.

Skybryte Co., Cleveland—This company's catalogue (No. 8) contains much information relative to the various types of paints produced by the concern for industrial uses. Prices are included as are numerous photographs.

Yarnall-Waring Co., Philadelphia, Pa.—A revised and enlarged edition of the company's bulletin on impulse steam traps (T-1735) has just been printed. Attractive in appearance, this bulletin has within its 14 pages, considerable information regarding the construction and operating features of the product. Dimensional data are included and there are several photographs showing the traps installed on dryer rolls. The company also has released a bulletin (G-1304) on steam plant equipment which it produces. This bulletin briefly describes the valves, traps, nozzles, expansion joints, and similar products of the company.

BOOKS

Procedure Handbook of Arc Welding Design and Practice (Sixth Edition)—Published by The Lincoln Electric Company, Cleveland, Ohio, this volume contains more than 1100 pages of essential arc welding data. It is profusely illustrated, containing 1557 illustrations, including photographs and drawings. The text, divided into eight sections, covers the following subjects: welding methods and equipment; technique of welding; procedure, speeds and costs for welding mild steel; structure and properties of weld metal; weldability of metals; designing for arc welded steel construction of machinery; designing for arc welded structures; and typical applications of arc welding in manufacturing, construction and maintenance.

The handbook, which is encyclopedic in scope, has a page size of 5¾ by 9 inches. It is bound in dark blue, semi-flexible, simulated leather. Title on backbone and front cover is printed in gold.

The publisher has priced the book at $1.50 a copy in the United States, $2.00 a copy outside the United States.

Rubber Latex—This volume, reproduced as the first American edition by Chemical Publishing Co., Inc., 148 N. Lafayette St., New York, N. Y., by permission of The British Rubber Publicity Association, is the work of Henry P. Stevens and W. H. Stevens. It treats of the source and production of latex, properties of latex, concentration of latex, manipulation and compounding of latex, vulcanization of latex and latex products, manufacturing from latex by dipping and electrodeposition, applications and products of latex, and marketing of latex. In addition, there is an extensive section on patents. The publisher has priced the book at $2 a copy.

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CURRENT MARKET QUOTATIONS

RAGS (Domestic)
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NEW RAGS — per cwt.

Blue Overalls	4.75 to 5.00
Corduroy	2.50 to 2.75
Cottons—	
Washables, No. 1	2.00 to 2.25
Fancy Percales	3.75 to 4.00
New Soft Blacks	3.50 to 3.75
New Light Seconds	1.75 to 2.00
New Dark Seconds	1.60 to 1.75
Khaki Cuttings—	
Mixed	2.75 to 3.00
O. D.	3.25 to 3.50
New Canvas	7.75 to 8.25
New Mixed Blacks	2.50 to 2.75
Shirt Cuttings—	
New White No. 1	7.25 to 7.50
Silesias No. 1	4.50 to 4.75
New Unbleached	7.00 to 7.25
Fancy	2.25 to 2.50

RAGS (Domestic)
f. o. b. New York City

OLD RAGS

Roofing— per cwt.	
No. 1	.90 to .95
No. 2	.80 to .85
No. 3	.70 to .75
Twos and Blues—	
Repacked	1.65 to 1.80
Thirds and Blues—	
Repacked	1.40 to 1.50
Miscellaneous	1.10 to 1.20
White, No. 1—	
Repacked	3.00 to 3.25
Miscellaneous	2.75 to 3.00
White, No. 2—	
Repacked	2.50 to 2.75
Miscellaneous	2.00 to 2.25

RAGS (Foreign)
ex dock New York City

NEW RAGS — per cwt. — Nominal

New Dark Cuttings
New Mixed Cuttings
New Light Silesias
Light Flannelettes
Unbleached Cuttings
New White Cuttings
New Light Oxfords
New Light Prints

RAGS (Foreign)
ex dock New York City

OLD RAGS — per cwt. — Nominal

No. 1 White Linens
No. 2 White Linens
No. 3 White Linens
No. 4 White Linens
No. 1 White Cottons
No. 2 White Cottons
No. 3 White Cottons
No. 4 White Cottons
Extra Light Prints
Ord. Light Prints
Med. Light Prints
Dutch Blue Cottons
French Blue Cottons
French Blue Linens
Checks and Blues
Linsey Garments
Dark Cottons
Old Shopperies

ROPE and BAGGING
f. o. b. and ex dock New York City

Gunny No. 1— per cwt.	
Foreign	2.50 to 2.60
Domestic	2.50 to 2.60
Wool Tares— per cwt.	
Light	2.35 to 2.50
Heavy	2.50 to 2.60
No. 1 Scrap Bagging	2.25 to 2.40
Manila Rope—	
Foreign	4.25 to 4.50
Domestic	4.25 to 4.50
New Burlap Cuttings	3.25 to 3.50
Jute Threads—	
Foreign	3.25 to 3.50
Domestic	3.00 to 3.25
Strings—	
Sisal	2.25 to 2.50
Soft jute	3.25 to 3.50
Mixed	1.00 to 1.25

WASTE PAPER
f. o. b. New York City

Shavings— per cwt.	
White Envp. Cuttings	2.90 to 3.10
Ord. Hard White No. 1	2.35 to 2.60
Ord. Soft White No. 1	2.00 to 2.25
Soft White, Extra	2.50 to 2.65
Flat Stock—	
Stitchless	.95 to 1.00
Overissue Mags	.85 to .90
Solid Flat Book	.75 to .80
Crumpled No. 1	.65 to .70
Solid Ledger Books	1.70 to 1.80
Ledger Stock—	
White	1.50 to 1.65
Colored	1.05 to 1.20
New B. B. Chips	.40 to .45
Manilas—	
New Env. Cuts	1.90 to 2.00
New Cuttings	1.50 to 1.60
Sulphite Mill Wrappers	.45 to .50
No. 1 Old Kraft	1.35 to 1.50
News—	
No. 1 Wh. News Cuttings	1.40 to 1.50
Strictly Overissue	.65 to .75
Strictly Folded	.55 to .60
No. 1 Mixed Paper	.37½ to .42½

CHEMICALS
f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	3.75 -
Ground, cwt.	3.50 -
Powdered, cwt.	3.90 -
Blanc Fixe—	
Pulp, bulk, ton	35.00 to 40.00
Dry, barrels, pound	.0300 to .0400
Bleaching Powder—	
Drums, cwt.	2.00 to 3.00
Casein (Domestic Standard)—	
20-30 mesh (bags), lb.	10.50 -
80-100 mesh (bags), lb.	11.50 -
Argentine, lb.	10.00 -
China Clay—	
Domestic Filler	
Bulk (mine) ton	7.50 to 15.00
Domestic Coating	
Bulk (mine) ton	11.00 to 22.00
Imported (ship side)	
Bulk (lump) ton	13.00 to 25.00
Chlorine—	
Tank cars (wks) cwt.	1.75 to 1.90
Gelatine (silicin), lb.	.53 to .55
Glye. (C.P.) drums, lb.	.1250 to .1300
Litharge, powd., bbl., lb.	.0775 to .0800
Rosin (Gum)—	
New York, 280 lb. barrel	
E, per bbl.	5.75
F, per bbl.	5.90
G, per bbl.	6.00
WW, per bbl.	7.50
Rosin (Wood), per bbl., carlots	4.60 to 6.15
Salt Cake—	
Dom. bulk (wks) ton	16.00 to 17.00
Imp. bulk on dock—	
(Atl. ports) ton	20.00 to
Soda Ash—	
Bulk (works) cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—Ammonia,	
Solid, drums, cwt.	2.30 -
Ground and flake, drums, cwt.	2.75 -
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.00
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.20
Starch—	
Pearl, 140 lb. bags, cwt.	2.70 -
Pearl, barrels, cwt.	2.80 -
Paper (8p.) bags, cwt.	2.80 -
barrels, cwt.	2.90 -
Sulphur (crude)—	
(mine) bulk, long ton	18.00 to 20.50
Talc—	
Dom. 100 lb. bags (mine) ton	14.00 to 17.25
Imp. bulk, ton	23.00 to -
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¼ to .05½
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	.07¾ to .07¾

CHEMICAL PULP
(Air-dry ton)

Soda (Dom.) del'd. mill— per cwt.	
Bleached, contract	2.90 -
Sulphate (Dom.) f. o. b. mill—	
Bleached	3.50 to 3.75
Kraft No. 1	2.75 to 3.00
Kraft, Southern, del.	2.75 to 3.00
Sulphate (Imp.) on dock—	
Bleached	3.65 to 4.00
Kraft No. 1	2.90 to 3.25
Kraft No. 2	2.80 to 3.00
Sulphite (For.)	
On dock—	
Prime bleached	3.40 to 4.00
Prime easy bleach	3.25 to 3.60
Prime strong unbl.	3.00 to 3.50
Sulphite (Dom.)	
Bleached, contract	3.07½ to
Unbleached, contract	2.62½ to

MECHANICAL PULP
(Air-dry ton)

No. 1 Dom. & Can. per ton	
(f. o. b. pulp mill)	31.00 to 35.00
No. 1 Imp. (On dock)—	
Moist	38.00 to 42.00
Dry	40.00 to 45.00

PAPER
f. o. b. New York City

Boards— per ton	
Binders	74.00 to 77.00
Chip	35.00 to 40.00
Chip, agl. mla. lined	52.50 to 55.00
Coated, white patent	
.016	70.00 -
.020 and heavier	67.50 -
Kraft liner	55.00 -
News	35.00 to 40.00
Book (coated) per cwt.	
No. 1 Glossy Coat	11.50 to 13.50
No. 2 Glossy Coat	10.35 to 11.75
No. 3 Glossy Coat	9.55 to 11.00
No. 4 Glossy Coat	9.15 to 10.50
No. 2 Offset	7.70 to 9.00
A Grade M. F.	6.40 to 7.15
A Grade Super	6.65 to 7.40
B Grade M. F.	5.95 to 6.70
B Grade Super	6.20 to 6.95
B S. & S. C. Litho	6.45 to 7.20
B M. F. Litho	6.20 to 6.95
Ivory & India	.50 cwt. extra
Bonds (Rag Content)—	
100% Rag per cwt.	
Ext. No. 1	39.10 to 46.00
100% Rag	31.05 to 36.50
85% Rag	
75% Rag	23.60 to 27.75
65% Rag	20.50 to 25.00
50% Rag	17.55 to 21.50
25% Rag	14.65 to 17.75
Regular Colors	1.00 cwt. extra
Bonds (Sulphite)— per cwt.	
No. 1	8.95 to 11.00
No. 2	8.05 to 9.75
No. 3	7.60 to 9.25
No. 4	7.30 to 9.00
Colors	1.00 cwt. extra
Glassine (f. o. b. mill)— per cwt.	
Embossed (25 lb. up)	13.25 -
Bleached (25 lb. up)	12.25 -
Unbleach. (25 lb. up)	11.00 -
Greaseproof—	
Bleach. (25 lb. up)	10.00 -
Unbleach. (25 lb. up)	9.00 -
Ledgers (Rag Content)—	
100% Rag per cwt.	
Ext. No. 1	40.25 to 47.25
100% Rag	32.20 to 37.75
85% Rag	29.90 to 35.00
75% Rag	24.75 to 29.00
65% Rag	21.65 to 26.25
50% Rag	18.70 to 22.75
25% Rag	15.80 to 19.25
Regular Colors	1.00 cwt. extra
Ledgers (Sulphite)— per cwt.	
No. 1	10.10 to 12.25
No. 2	9.25 to 11.25
No. 3	8.50 to 10.75
No. 4	8.50 to 10.25
News— per ton	
Rolls (Contract)	50.00 -
Rolls (Spot)	(nominal)
Sheets	58.00 -
Tissues (Carlots)— per ream	
White, No. 1	.92½ -
White, No. 2	.85 -
Anti-Tarnish M. G.	.80 -
Colored	.87½ -
Kraft	.90 -
Manila	.85 -
Napkins, semi-crepe (12¾ lb. to M shts.) per cs.	.41 -
Napkins, full crepe and emb'sed (12¾ lb. to M shts.) per cs.	.43½ -
Toilet, Bleached (M shts.) per cs.	5.80 -
Toilet, Unbleached (M shts.) per cs.	3.50 -
Towels— per case	
Bleached	3.10 to 3.65
Unbleached	1.95 to 3.30
Wrappings (Kraft)— per cwt.	
Extra Quality	5.00 to 5.50
Super-Standard	4.62½ to 5.00
Northern Standard	4.25 to 4.80
Southern Standard	4.25 to 4.50
Wrappings (Sulphite and Bleached Kraft)— (Rolls, f. o. b. mill)	
Bleached papers—	
M.F. & M.G. Waxing, 20 lb. (Carloads only) (10,000 lbs.) per cwt	6.15 -
Drug wrapp. 35 lb.	6.40 -
	6.25 -
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	4.50 -
No. 1 Butchers	4.75 -
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	5.00 -
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	4.75 -
Steam Finish, 50 lb.	4.00 -
Water Finish, 40 lb.	4.80 -
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	5.00 -
Envp. Mla., Sub. 16-38 (No. 2)	4.75 -
Envp. Mla. (Prices based on large sheets untrim'd remarked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	5.25 -
No. 2	5.00 -
M. G. Sulphite and Kraft (other than Waxing)	
Grade A-25 lb.	5.75 -
Grade B-25 lb.	5.25 -